Connectivity Africa External Review Report

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Appendices

1 Acronyms

AFNOG	African Network Operators Group
AIF	Agence intergouvernementale de la Francophoni
AISI	African Information Society Initiative
ALF	Annual Learning Forum
ART	Anti-Retroviral Treatment
ARV	Anti-Retrovirals
CA	Connectivity Africa
Catia	Catalysing Access to ICTs in Africa
CfSK	Computers for Schools Kenya
CME	Continuing Medical Education
DFID	UK Department for International Development
DTS	Data Transformation Services
ECA	[United Nations] Economic Commission for Africa
ENRENs	National Research and Education Networks
EASSY	Eastern Africa Submarine Cable System
FMFI	First Mile, First Inch
FOSS	Free and Open Source Software
FRAO	Fondation Rurale pour l'Afrique de l'Ouest
GSM	Global System for Mobile Communications
HIN	Health Information Network
ICA	Instituto para la Conectividad en las Américas
ICT4D	Information and Communication Technologies for Development
ICTs	Information and Communication Technologies
IDRC	International Development Research Centre
ISPA	Internet Service Providers Association
IXPs	Internet Exchange Point
KDN	Kenya Data Networks
LMS	Learning Management System
MHIN	Mozambique Health Information Network
MICTI	Mozambique ICT Institute
NAACs	National Acacia Advisory Committees
NGOs	Non-Governmental Organisations
NRENs	National Research and Education Networks
OpenMRS	Open Medical Record System
PAREN	PAN African Research and Education Network
PCRs	Project Completion Reports
PICTA	Partnership for ICTs in Africa
PIs	Programme Initiatives
PDAs	Personal Digital Assistants
REN	Research and Education Network
RIJA	African Legal Information Network
SGG	General Secretariat of Burkina Faso Government
SNA	SchoolNet Africa
TL	Team Leader
UCAD	Cheikh Anta DIOP University of Dakar
UEM	University Eduardo Mondlane
UHIN	Uganda Health Information Network
USAID	United States of America Development Agency
VSAT	Very Small Aperture Terminals
WCFA	Wireless Capacity for Africa
WiFi	acronym for wireless fidelity
WiMax	'Worldwide Interoperability for Microwave Access
ZCP	local ICT company, ZCP Informatique

2 Executive Summary

2.1 PI/Corporate Aims

One of the three initiatives recommended by the Digital Opportunity Task Force is Connectivity Africa: a programme to improve access to information and communication technologies (ICTs) in Africa.

Connectivity Africa is an IDRC programme, managed by IDRC, funded by the Canada Fund for Africa. It has four programme areas:-

1. Innovation in the use of ICT
2. African Regional ICTs
3. Research and Development in African ICTs
4. Partnerships and networks

2.2 Review methodology

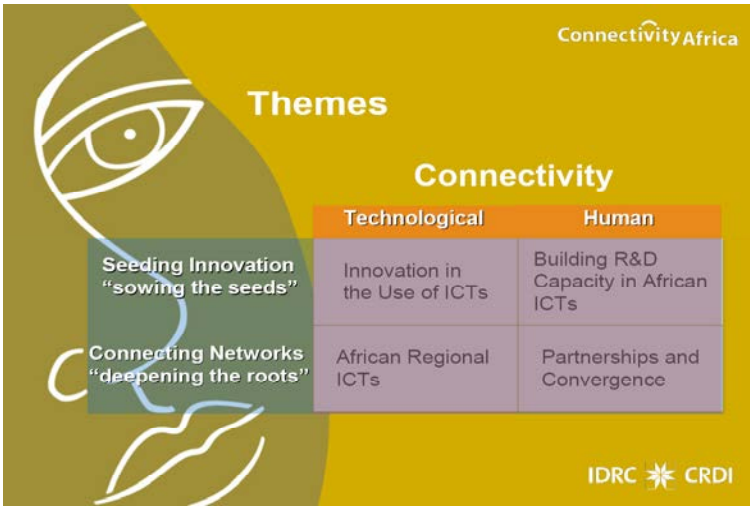
The External review was conducted by Dr Simon Batchelor with the assistance of Mr Moctar Sow. Dr Batchelor had been team leader for the External Review of Acacia, and there is considerable overlap of the stakeholders, partners and staff between Acacia and Connectivity Africa.

The team used a mix of primary and secondary data sources. The data collection methods included document review, individual and group interviews, observation, and field visits. Data collection began in January 07, with most activities concentrated in the month of March 2007. Field visits included South Africa, Mozambique, Kenya, Uganda, Ethiopia, Senegal and Burkina Faso and London UK. Connectivity Africa has often funded multiple projects that work together for a common theme. The field visits resulted in interviewing stakeholders involved in over 30 funded projects, although these projects can be conceptualised as 13 clusters or suites of projects.

2.3 Review findings

2.3.1 Themes as a driver

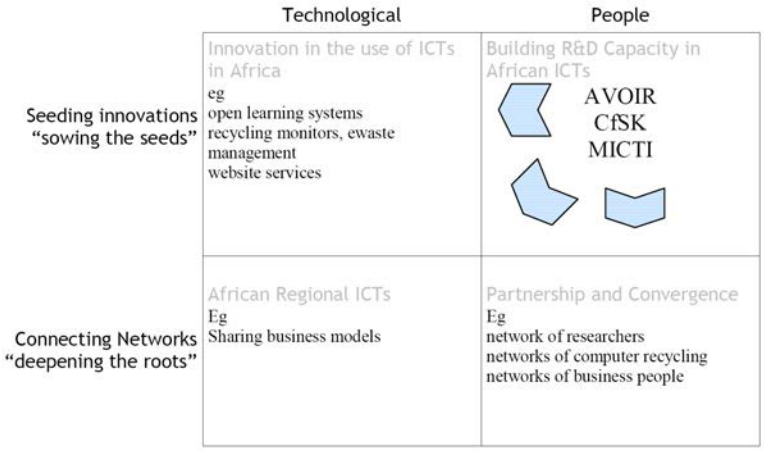
As stated above Connectivity Africa was guided by four themes. In order to understand the relationship between the themes, the ICRD CA Team Leader presented the following matrix to the advisory group. Acknowledging that Africa's digital divide is not just a question of technology but of human capacity as well, the matrix offers two columns – human and technological. For the rows the matrix takes the imagery of seeds. Africa needs "seeds", i.e. new approaches, new adaptation of technologies, new capabilities in order to make the most from ICTs. Also the emerging plants need to deepen their roots and be strengthened; CA saw that this strengthening would come through networks – both technological infrastructure and people. These thoughts come together to enable mapping of the themes on a matrix:-



It was possible to map the case studies onto the matrix. In each of the following the cluster case study name is placed in the quadrant it was assigned by "administration". The arrows and the brief examples illustrate how the case study has contributed to the wider programme, and the CA programme themes. In all cases but to varying degrees a project is not restricted to one themed response.

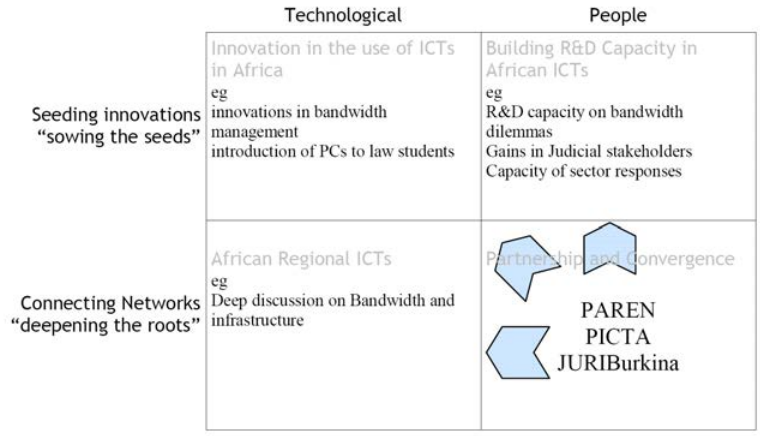
	Technological	People
Seeding innovations "sowing the seeds"	Innovation in the use of ICTs in Africa UHIN ART Rollout FMFI	Building R&D Capacity in African ICTs e.g. CME for health workers, improved information systems, training of innovators, researchers gaining outcome mapping skills
Connecting Networks "deepening the roots"	African Regional ICTs e.g Sharing lessons with MHIN, Leading on to OpenMRS, co-operation between SA and Mozambique	Partnership and Convergence e.g. networks into HIV/AIDs community, network of researchers

From the Antiretroviral Treatment (ART) Case Study - "The support for the collection and management of data and for the software for the management of such data, are both significant research and learning projects. Implemented by the respected Medical Research Council (MRC) they have been integrated into the Province-wide health care, giving an effective implementation and scaling and securing the "buy in" of Province wide services that could be taken up at national level, although the policy environment in South Africa remains difficult to navigate concerning Antiretroviral treatment. They potentially contribute enormously to this emerging area of Management Information Systems (MIS) in health."



From the Case Study of Computers for Schools Kenya (CfSK) - "If we now consider the CfSK model in this light (of recommendations made by an earlier SchoolNet study) it compares very favourably. It prechecks its suppliers – ensuring that only computers that exceed a minimum specification are sent. This reduces its drop out rate to about 5%. The whole rationale of the CfSK model is working computers in schools adequately supported – not just PCs dumped in a school. Refurbishment is conducted by CfSK a local NGO within Kenya. It delivers 20 PCs to a school, justifying training of teachers in basic computer care and developing ICT capability in schools. It ensures that operating systems are installed and that the computers have a minimum of software. It has developed refurbishment and maintenance skills in Africa – indeed it goes one step further setting up local maintenance sites. It has co-ordinated its suppliers. It does build in-school capacity.

Certainly the CfSK model seems very comprehensive. Taking selected refurbished computers it can install, train local teachers and in the main provide localised maintenance. When the life of the computer is finished it has arranged an impressive ewaste management, selling some materials back to China, others locally, and turning items such as monitors into televisions. It is currently working with neighbouring countries such as Uganda to replicate itself."



From the PAREN Case Study and from the UbuntuNet Alliance website - "Established and emerging NRENs (National Research and Education Networks) in Kenya, Malawi, Mozambique, Rwanda and South Africa have come together as the Founders of a new grouping: the UbuntuNet Alliance for Research and Education Networking. The vision of delivering very high speed - gigabits (Gb/s) connectivity instead of the current kilobits (kb/s) between African

Universities and Research Institutions is driving the Alliance forward at a rapid pace. The UbuntuNet Alliance is registered as a non-profit association of NRENs in the Trade Register of the Chamber of Commerce and Industry of Amsterdam."

This is a very solid long term outcome of the IDRC involvement. UnbuntuNet Alliance has a momentum that should see it into the future. It has the capacity to adapt to the rapidly changing context of African connectivity, and be able to assist higher education institutions to get the most from whatever is available."

Such positive comments can be translated into headlines against the themes:-

Innovation in the Use of ICTs

Low cost alternatives have been demonstrated. In particular :-

- the use of wireless technologies over distance in order to share bandwidth across local institutions (Schools, Government Centres, Telecentres and Medical facilities). There is a danger that the technical output of such experiments will be overtaken by new technologies (eg WiMax), however, the people networks and capacity built are valuable in the longer term.
- refurbished computers have been shown to be a viable mainstream low cost technology for Schools
- the use of PDAs have been demonstrated as a viable means of collecting field data, and for a two way flow of information including personal professional development

The main text demonstrates that a cadre of Africans have explored and learnt about wireless technologies. Their capacities have increased, and whichever direction the technology goes, their confidence to try innovation has been increased. This confidence to explore is a valuable commodity in ICT. ICT is an ever changing sector, and new opportunities and possibilities are constantly arising. If people have gained a confidence that just says, "I could try and see if it works", then that alone is of incredible value.

Demonstrating the innovative use of ICT, has influenced policy makers. For instance the MRC in SA has been able to gain a view on information management within the SA health system which has changed from disease orientation to a patient focus. It is clear that CfSK and UHIN have influenced policy makers in Uganda, Kenya, Mozambique. In addition to this the projects, and hence the programme, may have influenced policy makers beyond their immediate stakeholders. These innovations are exploring the windows of opportunities opened by technical changes, and as such are influencing research and policy.

African Regional ICTs

The cadre of researchers mentioned above have also explored the regional connectivity, and found a voice to argue their case for better connectivity. In particular:-

- Academia has been developing plans that will enhance regional connectivity
- Activities on the GSM network have facilitated peering of GSM networks
- Wireless capacity building workshops brought together players from different countries that will work together towards regional actions as and when appropriate.

The higher educational institutes of a number of countries have addressed their connectivity issues. This has not only enhanced their own understanding of connectivity and its place in research and education, but they have been able to get involved with and take advantage of a significant policy "window of opportunity". Policy has been affected within universities, within national educational policy and within regional ICT infrastructure. As has been discussed, the involvement of UbuntuNet Alliance was key in the fibre optic discussions and whether bandwidth should be based on the Open Access principles.

Research and Development in African ICTs
Connectivity Africa has been able to involve research institutions in a number of key activities that could have longer term impact, while at the same time building the research capabilities For instance

- MICTI has contributed to Government plans for ICT business
- AVOIR has led to a growth in software development in universities
- AVOIR has contributed to elearning within Academia
- ART has demonstrated efficiencies that could be applied throughout the continent.

Universities have explored working with the private sector, in the context of the development of the country. This theme of R&D in African ICTs has also contributed to policy development. For instance, MRC is discussing with Provincial Health authorities about the handling of management information systems, and is moving towards a harmonisation across South Africa. MICTI has been able to broaden the horizon of the Ministry of Science and Technology regarding its Science Park development and longer term plans for strengthening the Mozambique economy. These actions found a window of opportunity i.e. the government considering Science Park models, and was able to bring together a community of change i.e. former Board members of the MICTI incubator development who were able to influence the government.

Partnerships and networks
This theme focussed on the needs for partnerships and networks. In terms of policy influence it was looking for communities of change, and has succeeded. In particular:-

- Academic alliances have demonstrated the value of collective bargaining
- Partnerships have shown how Open source software can be developed into viable packages (OpenMRS and EKewl)
- Judicial openness demonstrates the role of technology in creating a partnership base for a mainstream sector in a country and in a region.
- Donor co-operation has led to synergies and gains (eg Catia, CA and ECA)

The community of change created by the alliance of Catia, CA and Acacia stakeholders should not be underestimated. While Catia was focused more on planned policy influence, it often drew on the same people as CA (people who had had their capacities enhanced by CA projects) and on the results of the CA programme,
Were the themes appropriate, and do the headlines of outcomes given above add up to overall programme value? Our judgement is that it does add up to value. In any innovative venture, there is relatively high risk. The market may not be developed, the concepts or ideas may seem "far fetched" to the status quo, the technology may stumble or by their very nature, pioneering personalities may be difficult to work with and may not stick around to see an idea through. Since Connectivity Africa was commissioned to be innovative, in terms of process it potentially faced some or all of the above. Its navigation through this difficult space without landing on the rocks is a credit to the team.

As described in the main report, and illustrated on the thematic matrix, the individual projects covered both technical innovation and sowed seeds into people. The projects have put in place and contributed to deep discussions about technical connectivity across Africa engaging with private sector and government to influence regional connectivity. And it has built capacity, in African R&D and in partnerships. None of the projects can be called a failure. Even the very few that did not reach their initial objectives tended to contribute to the network development, to discussion and to general knowledge. And the majority achieved their project objectives and contributed to the themes.

Overall the programme presents good value for money. In comparison with similar programmes such as Catia and Acacia, the programme stands with an equivalent value.

Overall Connectivity Africa has:-

- Made significant progress towards its objectives
- Explored low cost alternatives for improved connectivity
- Undertaken activities that have led to strong potentially sustainable networks and partnerships
- Positioned networks with capacity that can influence regional connectivity issues
- Offered synergies between projects, and with its sister programme Acacia
- Been a timely programme, appropriate for the changing African ICT sector
- Been managed by a professional team who have been able to make appropriate decisions

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- Undertaken activities that need ongoing support to mature them into scaleable actions

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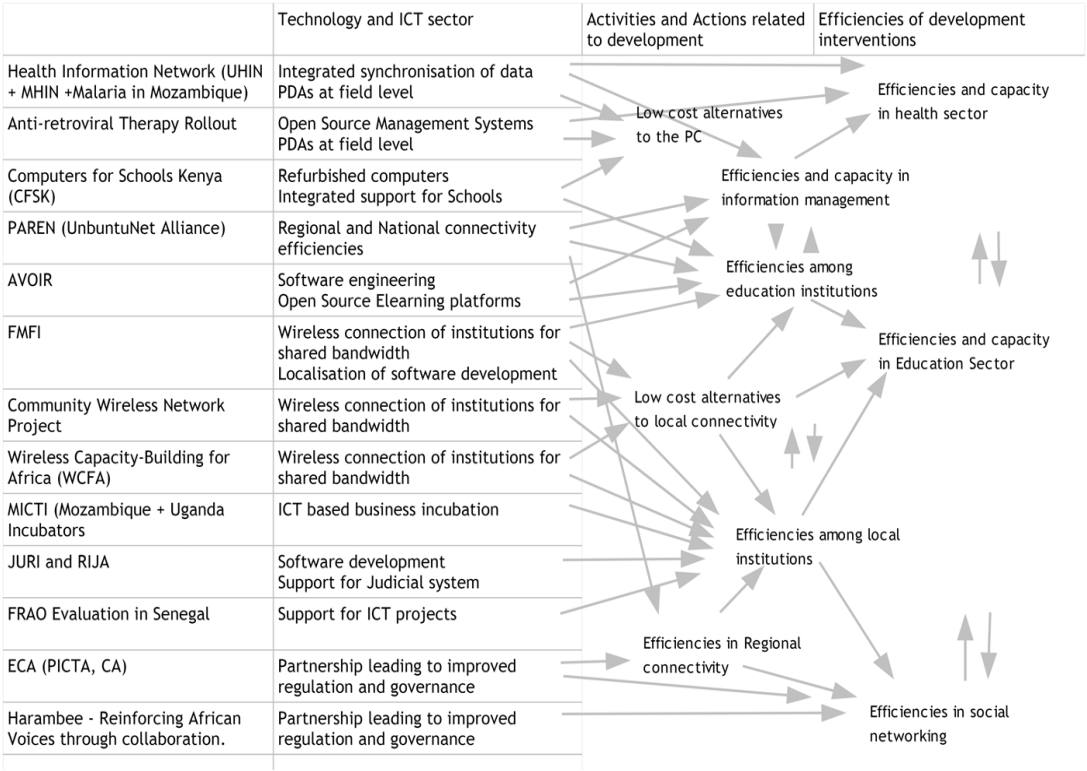
- Been weak in encouraging all projects to consider the gender impact of their work as a cross cutting theme
- Not offered a coherent single resource for its findings and lesson learning that has utilised the value of the IDRC branding
- Had an advisory group that did not add as much value as hoped although it stimulated donor cooperation which was invaluable
- Had a partnership with ECA that might have been enhanced

The following diagram illustrates how the case study projects have contributed to broader social and economic development themes.



2.4 Issues for consideration

Connectivity Africa was a timely programme. Its presence and flexible funding added value to the rapidly changing ICT sector of Africa. Its emphasis on network and partnerships was an extremely pertinent strategy for the objective of capacity building, and has left potentially sustainable networks.

If a Connectivity Africa II is envisaged it should retain its emphasis on building capacity, retain the strategy of networks and partnership and continue to push for regional connectivity. While it should keep a view on innovative technology, it should widen the view to include convergence with traditional media, applications and the role of ICT in efficient and effective delivery of development interventions.

It would be wholly appropriate for the same team to manage and implement CA II alongside Acacia. It would be good to continue close co-operation with other donors as and when appropriate and an annual shared workshop with other donors would be appropriate. An advisory group meeting on a 6 monthly basis would **not** be advised. Close cooperation with UNECA needs to be focused around specific activities which UNECA can take the lead on.

Acknowledgements
The authors would like to thank the IDRC team for all their assistance in this External Review. They would also extend thanks to all the stakeholders that consented to an interview.

3 Background

(From the website)
"At the June 2002 G8 Summit in Kananaskis, Canada announced three initiatives as part of its response to the G8 Africa Action Plan and the recommendations of the Digital Opportunity Task Force. One of the three initiatives is Connectivity Africa: a programme to improve access to information and communication technologies (ICTs) in Africa. Connectivity Africa is being implemented by Canada's International Development Research Centre (IDRC) in partnership with the United Nations Economic Commission for Africa. The initiative supports research, development and innovative uses of ICT applications for African development. Priority sectors include education and health."

"Connectivity Africa is managed by IDRC though its offices in Ottawa, Cairo, Dakar, Nairobi and Midrand, South Africa. It operates in parallel with IDRC's Acacia Initiative, which supports ICT research and initiatives to empower sub-Saharan African communities. Funding for Connectivity Africa comes from the Canada Fund for Africa"

3.1 Core Program Areas

"Connectivity Africa programme guidelines flow from the priorities identified by the Digital Opportunities Task Force and the African Information Society Initiative (AISI) framework coordinated by the UN Economic Commission for Africa. Connectivity Africa provides funding support to projects in four areas:

3.1.1 Innovation in the use of ICT

"New and innovative ICTs are evolving at an unprecedented rate, and many of these technologies are surprisingly robust and inexpensive, offering opportunities for sustainable application in Africa. Connectivity Africa will support projects that explore and apply this new generation of ICTs in support of development goals. In particular, the initiative will support innovations for low-cost, reliable access in under-serviced areas, both rural and urban. "

3.1.2 African Regional ICTs

"Regional economic development relies on effective and inexpensive communication among African countries. Connectivity Africa seeks to address this challenge by facilitating linkages

between national strategies and regional infrastructure priorities, and by supporting the development of mechanisms for enhancing intra-regional Internet connectivity. "

3.1.3 Research and Development in African ICTs

"The capacity to innovate and develop African solutions to connectivity challenges is a key to sustainable and locally owned development of the continent. Connectivity Africa will support ICT innovation and research capacity in African institutions, especially universities. In particular, it will support the development of an observatory on the diffusion and use of ICTs in Africa. "

3.1.4 Partnerships and networks

"Many African countries share the same challenges in areas critical to development, such as health, education, and infrastructure. Connectivity Africa supports African networks which seek to share expertise and knowledge across national borders. It will also develop mechanisms for co-ordination among donors involved with ICTs for African development."

These four key elements of the strategy have informed the development of CA, and the findings are structured around them.

While the proposition for the programme pre funding was for an African institution, by the start of the programme it was as described above - a programme of work managed by IDRC through its four offices. For the first year it was handled quite separately from Acacia. However, as the programme continued the team realised that it should be closely integrated with the Acacia work. Throughout this document the reviewers refer to Acacia, since the integration and synergies of the two programmes, CA and Acacia are relevant to the review.

'Acacia II has been working towards a vision for Africa where "Africa is actively contributing to and benefiting from the global knowledge economy, and ICTs appear on the policy agenda of all African countries as a means to raise and improve living standards for all (including rural as well as urban dwellers, women, men, children, youth and the disabled populations).' Acacia II Prospectus 2001 Acacia II has worked towards this vision by undertaking action research in communities and circumstances of poverty in Africa and supporting applied research that fosters pro-poor ICT based policies and functionally relevant technical solutions within the African context." Acacia External Review 2005

While Acacia focuses on applied research that includes "functionally relevant technical solutions", Connectivity Africa has been able to complement those activities with a more

innovative mandate. Acacia learnt that networks and partnerships were mechanisms for sustainability and impact, and this lesson was applied to the formation of Connectivity Africa and its emphasis on networks.

4 Methodology

The Term of Reference for the External Review are available in an appendix.
The External review was conducted by Dr Simon Batchelor with the assistance of Mr Moctar Sow. Dr Batchelor had been team leader for the last External Review of Acacia, and there is considerable overlap of the stakeholders, partners and staff between Acacia and Connectivity Africa. Moctar Sow was commissioned to assist Dr Batchelor regarding the projects and documents which use French.

The team used a mix of primary and secondary data sources. The data collection methods included document review, individual and group interviews, observation, and field visits. Data collection began in January 07, with most activities concentrated in the month of March 2007. The choice of Case Studies was made in discussion with the IDRC team, and forms a purposive sample.

4.1 Document Review

The team reviewed a wide range of documents related to the case study projects, other CA projects, program and IDRC documentation. The CA TL made available documents in two archived zipped folders "Project Documents" (94Mb) and Related Documents (7Mb). Some further key documents were delivered after the first draft of the report. A list of documents is provided in an appendix. The review also looked at the internet to investigate the presence of the projects on the web. The main sites for each case study were examined in detail, and related links. A semi systematic Google search was also conducted on related subjects. Keywords used are given in an appendix.

4.2 Case studies and field visits

Many of the CA projects have been funded over the lifetime of CA in a number of small grants. Often the combination of projects funded with different project number identifiers, and with different titles, have effectively formed a single thread for a project or programme which can be discussed as a whole. Table 1 presents all the project identifiers used in developing the case studies, however, Table 2 consolidates these into a set of named activities that can be considered a single case. Choice of Case Studies was made in discussion with the IDRC team. For reference, a complete list of CA projects is presented in an appendix.

Table 1 from Workplan, discussing individual projects and reasons why recommended.

Project No	Project title	Characteristic re Review	Region
102136	Uganda Health Information Network	Key project with many stages, Highly innovative, interaction with Govt (Recommended by Team Leader (TL) and East Africa (EA))	East
102138	MICTI ICT Incubator	Substantial investment, (TL)	South
102139	Computers for Schools Kenya (CfSK)	Long term project, (TL & EA)	East
101981	Comparative study of "first mile" and "first inch" technologies in different low-density contexts	Used Outcome mapping, mix of technologies, reviewer visited before (so getting before and after impressions)	South
102213	PICTA 2003	Outcome mapped, Relationship with ECA, (TL)	Overview

102509	African Virtual Open Initiatives (AVOIR)	A network of researchers working across the continent	South
102547	1st CA Advisory Committee Meeting (Mauritus)	Relationship with ECA and other donors inc Catia, (TL) (Reviewer some prior knowledge)	Overview
102231	Support for CA and UN Economic Commission for Africa Collaboration	Relationship with ECA, (TL)	Overview
102411	Development and Interpretation of a Medical and Informatics Database to Support and Evaluate the Public Sector Ani-retroviral Therapy Rollout in SA	Very innovative, high profile subject area, (TL)	South
103103	Second Connectivity Africa / CATIA Advisory Committee Meeting	As above	Overview
102530	Atelier de développement et de formation sur les techologies sans fils (wireless)	North Africa, (North Africa (NA) & TL)	North
102539	AFNOG V Workshop	Workshop in context of PAREN – reinforces view of PAREN	Overview
102543	JuriBurkina - un premier Centre d'information juridique en Afrique de l'Ouest	Main West African activity, West Africa (WA) & TL)	West
102545	Appui en suivi évaluation au programme CA	Alternative West African activity, (WA)	West
102819	Computeres for School Kenya- Phase III	As above	
102998	Promoting African Research & Education Networking (PAREN)	Highly influential, pan african initiative, involved in many levels of activity. (TL)	Overview
103096	Training Workshop and Conference for the African Network Operators Group (AFNOG)	Workshop in context of PAREN – reinforces view of PAREN	Overview
102513	Facilitation of the development of a PAN African Research and Education Network (PAREN) for access to improved Internet bandwidth	As above	Overview
103070	Pan African Research and Education Network (PAREN) Donor Survey	As above	Overview
102982	Harambee: Reinforcing African Voices through collaboration	Small project, adds balance to review, (TL)	East
103134	Réseau d'information Juridique Africain	Closely linked to JuriBurkina above, Alioune, (TL)	West
103158	Promoting African Research and Education Networking (PAREN)	As above	Overview
103126	Uganda Community Wireless Network Project	Small project, strategic regarding telecentres	
103850	Uganda Health Information Network Phase 3	As above	East
103729	African Network Operators Group : Training Workshops and Conference (AFNOG 2006)	As above	Overview
103137	Promoting the African Research and Education Networking (PAREN): Preparation and Conference for WSIS 2	As above	Overview

The following were touched on by the interviews during travel:-

103138	Refurbishing the Manhica Telecentre after the fire.
103523	Wireless Training Workshop at WSIS
102534	PDAs for Malaria Monitoring in Maputo and Gaza Provinces
103729	WordForge

Table 2 presenting the amalgamated/merged project/programmes.

	Countries where interviews took place	Characteristics for review
Health Information Network (UHIN + MHIN +Malaria in Mozambique)	Uganda, Mozambique	Key project with many stages, Highly innovative, interaction with Govt (Recommended by Team
Anti-retroviral Therapy Rollout	South Africa	Very innovative, high profile subject area
AVOIR	Uganda, Kenya, Mozambique, South Africa	A network of researchers working across the continent

	Mozambique, South Africa	
PAREN (UbuntuNet Alliance)	Uganda, Kenya, Mozambique, South Africa	Highly influential, pan african initiative
Computers for Schools Kenya (CfSK)	Kenya	Long term project
FMFI	Mozambique, South Africa	Used Outcome mapping, mix of technologies, reviewer visited before.
MICTI (Mozambique + Uganda Incubators	Mozambique,	Substantial investment
JURIBurkina RIJA	Burkina Faso	Main West African activity
ECA (PICTA, CA)	Ethiopia, Uganda, Kenya	Relationship with ECA and other donors inc Catia

In addition there was opportunity to take a brief view at some very small or very recent Connectivity Africa projects. These are presented in an appendix, and mentioned in passing in the main text.

Wireless Capacity-Building for Africa (WCFA)	N Africa (interviewed in London)	Bringing together lessons learned from many projects.
Community Wireless Network Project	Uganda	Small project, strategic regarding telecentres
FRAO Evaluation in Senegal	Senegal	Small project, adds balance to review
Harambee - Reinforcing African Voices through collaboration.	Uganda	Small project, adds balance to review

The clustered case studies were the amalgamated projects as outlined above. Since many of them were multi country or regional, this clustering gave an excellent sample for the Connectivity Programme Africa. The case studies represent 52% of all disbursed project funding. The geographical coverage reflected and was representative of the whole programme. The sample was able to give insight to projects with small funding such as FRAO Senegal and Harambee, and large multi year funded programmes of work such as the UHIN/MHIN cluster. The sample also covers a mix of programmes that were single country focused and regional activities.

As will be seen in the findings below, although the programmes were funded through the four core programme areas or themes, and each project was nominally assigned a theme for administration and discussion, actually the programmes often addressed several themes to some degree. For instance, while AVOIR is assigned to "Innovation in the use of ICTs", it is actually a network of researchers, and could easily be assigned to "Partnerships and Convergence". Similarly it is building the capacity of African researchers, and could be assigned to "Building R&D Capacity in African ICTs". Finally in its sharing of technology, it touches the fourth theme of "African Regional ICTs". As will be seen below, the clustered case studies more than adequately represent the four themes and allow for exploration of them.

Case studies involved project document review and field visits to interview stakeholders involved in the project and where appropriate observe the project in implementation.

The above plan enabled travel to be efficient, undertaking stakeholder interviews relating to multi country programmes to occur in more than one country. Travel itinerary and interviews undertaken are given in an appendix.

In addition to the above, key informant interviews were conducted with donors and international agencies. Those approached included DFID, Industry Canada, UNECA, CIDA, SIDA and IDRC.

4.3 Extensions and Limitations to the review

While interviews were conducted with key stakeholders in each of the projects, nevertheless, caveats should be made regarding the breadth of investigation for each case study. Due to the time allotted to the whole study, the team did not seek to conduct mini evaluations of each project nor systematically ensure that interviews were conducted with each stakeholder type. The interviews were a mix of key project stakeholders and boundary stakeholders. The approach was suitable for an overall external review of a programme initiative.

Documentation for the programme was significantly better than the Acacia II External Review. The Acacia External Review 2005 noted "Acacia appears to lack a comprehensive and functional project information management system." Given that the same team that manage Acacia manage CA, it must be noted that there has been a significant improvement. Documents were delivered in an organised fashion and there is obviously a system in place. A few key documents were omitted from the first delivery of documentation, and delivered after the first draft of this report, however that is to be expected in such a large and complex programme. This has not limited the review and there are no data gaps in the documentation noted.

The approach was also informed by the 2005 Acacia External Review, which Dr Batchelor led. From the Acacia External Review 2005, the reviewer had previously interviewed and got to know the IDRC CA team. The reviewer was familiar with team processes, and with some of the information management systems. It was decided that based on this prior knowledge, this review would not include a visit to Canada nor attendance at team get togethers. These decisions did not limit the review.

The reviewer was also the team leader for the Catia monitoring and evaluation. Catia was a programme of work funded mainly by DFID (UK). An appendix gives a brief description of Catia. Connectivity Africa has worked closely with Catia throughout the life of the two programmes, with a common advisory group, joint membership of PICTA, and some joint funding of work. The external reviewer as evaluator for Catia was thus present at some joint advisory group meetings throughout the lifetime of Connectivity Africa. He was also privy to CA presentations made during the last few years, discussions held with DFID, and has interviewed many boundary stakeholders of CA as part of the interviews for the Catia evaluation. These insights have been taken into account in the external review.

5 Findings

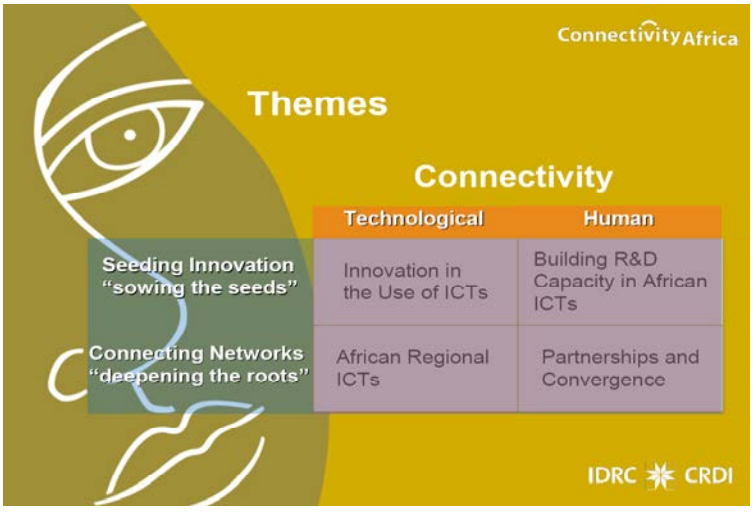
5.1 Unpacking the four themes

Before outlining the findings from each of the clustered projects, this section outlines the rationale for the four themes. The resulting "thematic matrix" enables each of the clustered projects to be assessed as to their contribution to the themes and to the overall delivery of the objectives of Connectivity Africa.

The CA website describes the core programme areas as themes and states:-

- **Innovation in the use of Information Communications Technologies**
  Helping Africans adapt new, low-cost ICTs that have particular relevance to African development.
- **Partnerships and Convergence**
  Encouraging African institutions, communities, and individuals to increase their influence and impact by working together.
- **Building R&D Capacity in African Information Communications Technologies**
  Helping Africans build the capacity to develop uniquely African ICT innovations tailored to local needs and preferences.
- **African Regional Information Communications Technologies**
  Breaking down the technical barriers that prevent Africans from connecting easily to one another.

At one of the first advisory group meetings, the members wanted to know why the themes were as they were? The response from the team leader was a presentation based on a slide (copied below) placing the themes in a matrix. Acknowledging that Africa's digital divide is not just a question of technology but of human capacity as well, the matrix offers two columns – human and technological. For the rows the matrix takes the imagery of seeds. Africa needs "seeds", i.e. new approaches, new adaptation of technologies, new capabilities in order to make the most from ICTs. Also the emerging plants need to deepen their roots, be strengthened, and CA saw that this strengthening would come through networks – both technological infrastructure and people. These thoughts come together to enable mapping of the themes on a matrix:-



As described in the limitations section, each of the projects and programmes was nominally allocated to fall in one of the themes. However, in practice the projects and clusters of projects often overlap a number of themes. As the clustered case studies are discussed below, the themes were used to anchor the findings. An analysis of the case studies with respect to the programme themes follows a section that first outlines the findings from each Clustered Case Study.

5.2 Health Information Network (UHIN + MHIN) Uganda, Mozambique

Website:- "The Uganda Health Information Network (UHIN) is an innovative, low-bandwidth information network for health workers in the Mbale and Rakai districts of Uganda. Using low-cost PDAs (Personal Digital Assistants) and a cellular telephony network, UHIN has cut costs and improved the quality and availability of health information. Its success demonstrates that PDAs can be used to establish an interactive infrastructure in regions serviced only by GSM (Global System for Mobile Communications) telephone networks."
http://www.idrc.ca/acacia/ev-86353-201-1-DO_TOPIC.html

"The reporting suggests that such a system is technologically viable, that the organisational capacity to manage such a network is reasonable, that the technology is readily adopted by end users, such a network is cost effective, yielding benefits to the health sector, data collection is improved, continuing medical education is improved."
http://www.healthnet.org/idrcreport.html

From the interviews and documentation it is clear that UHIN has been exploring the use of PDAs for the collection of information and automating the delivery of such information to health management information systems, and for delivery of continuing medical information to health professionals. The UHIN project introduced innovative mechanisms for wireless synchronisation of the PDA with the main health information networks.

When this project started in 2003 it was pioneering and unique. Hand-held PDAs had become common in business practice in Europe and USA, but were quite new to Africa. The idea of connectivity over the phone network, automating the download process and ensuring a dialogue with a two way flow of field information and continuing medical education all happening in rural Africa was a significant innovation. The programme has then not only pioneered the approach, but has gathered and published data on its cost effectiveness and cost benefit (efficiencies gained). The project demonstrated a scalable store and forward technology that enhanced the Government health system.

According to interviews, the two districts having started the project as poor in their reporting to the Ministry, are now regarded by the Ministry as the two best districts for reporting in the country.

Interviews suggest that while it seems that UHIN has indeed achieved some significant successes, there are also some challenges.

One of the challenges has been in the reliability of the wireless connectors, and after focusing for a while on the product called Wide Ray Jacks, it is now beginning to use a new product developed in South Africa which gives more flexibility (but at the time of writing is as yet unproven). The challenges over the connectivity have meant that some collection of data remains paper based as the health workers do not feel they can yet trust the system.

Smart phones and more data orientated phone networks may well offer new opportunities in 2007 and beyond, but UHIN remains an important pioneer, documenting the capacities

required for such an approach to reporting and CME, and presenting a proposition that challenges the conventional paper based processes.

A more significant challenge for the future, but one not related to the technology per se, has been the process of the project and the involvement of the Government. The project was started by NGO's combining with Universities. All permissions for the pilot were secured, and at a local level the project has gone well. However, at a national level the lack of involvement of the Government in the early development of the project has potentially left the project a little isolated from the national planning processes. The project has had to try to "sell" the idea within the Ministry if it wishes it to be expanded and scaled.

In contrast to the national response, the District health directors saw the benefit of the system and requested that the projects expand.

Also at the time of submission a key email was written to the IDRC team by the UHIN partner that speaks of a positive response from the Ministry - "I want to quickly bring you up to speed with the above meeting that finally took place today. The meeting was graced by the presence of Drs. Sewankambo and Mworozi from UCH side and Drs. Mukoyo and Kyobutungi and a few other personnel from MoH. The expected attendance from MoH was low but the important thing is that we met and reached consensus on the following issues:

1. PDAs have a role to play in the delivery of health care services in Uganda.
2. cost and maintenance are issues that need more understanding for better solutions.
3. availability of capacity for training and technical support.
4. need for expansion to other areas/applications like fiscal management, inter-sectoral collaboration, e-learning, surveys (Service Availability Mapping, Disease surveillance)
5. need for expansion to other districts.
6. need for cost-benefit analysis of use of PDAs and existing systems.
7. need for integration of PDAs into MoH activities
8. need for assessment of PDA participating districts."

From the interviews in Mozambique, the relationship with the Ugandan Ministry of Health stands in contrast to the new project Mozambique Health Information Network. Building on the lessons learnt in Uganda, this new MHIN project will develop similar systems. However a significant difference to the project design is the inclusion and support of the Government from the start.

UHIN was one of the first projects to adopt Outcome Mapping. The reviewer did not see the outcome journals, however, interviewees stated that the outcome mapping process was a useful mechanism to build ownership of the project, and was transformative for the researchers – changing them from a technology orientation to a more holistic approach.

One of the strengths of the system seems to be its ability to feedback to the field health workers continuing medical education (CME). Uganda has for many years published a home grown journal of health. The reviewer expresses surprise that this journal has not been made available on the system despite the journal being edited by one of the Board members of UHIN.

5.3 Anti-retroviral Treatment Rollout South Africa

Related to the above is subject area is the set of activities around open source development of Health Management Informations Systems in Free State and KwaZulu Natal.

Website:- "This project is developing an extensive and multi-purpose database system to collect and manage large volumes of time-sensitive data in the wide-scale roll out of anti-retroviral therapy (ART) for HIV-positive patients in South Africa. HIV is endemic in Africa, and the Free State province has South Africa's second highest HIV infection rate. To measure progress of the ART roll-out, the project's computerized system integrates information collected via hand-held computers at clinics into a database capable of multiple management functions."
http://www.idrc.ca/acacia/ev-86361-201-1-DO_TOPIC.html

Abstract (undated) - "Paper-based structured clinical records are widely used for monitoring and evaluating the public sector HIV anti-retroviral treatment (ART) programme in South Africa. Handheld computers (PDAs) were used during the first 18 months of the ART programme in the Free State province of South Africa to collect data from paper records at urban and rural sites. A commercial online computer system (Meditech) has replaced the handheld system. Microsoft SQL Server 2000 and Microsoft Data Transformation Services (DTS) were used to develop a data warehouse for integrating the data from both systems. The data warehouse was used to compile monthly and quarterly reports, National department of Health indicators, and quality control routines. External data from laboratories and home affairs data has also been integrated and is particularly useful for performing reliable survival analysis. Portal technology is used to deploy reports and quality control routines for data capturers, ART district coordinators, data quality managers and health care workers. Currently 28 000 patients are registered on the system, 4 500 patients are on ART, and 157 837 forms have been captured."
http://www.mrc.ac.za/conference/satelemedicine/Timmerman.pdf

"The room was filled with the powerful voices of at least 40 women and a few men singing and swaying, stomping and inflecting to the words of their composed songs. They were all on antiretroviral treatment (ART) and their clinic sister Soodie had motivated them to tell their stories. The volume was rising, they included a little step accompanied by the movement of their hands saying in Sotho: "Away with those people who are gossiping about us, we are surviving because of the anti-retrovirals (ARVs) and we know that they work!" And again, to the rhythm of the toyi-toyi (the freedom dance that became famous in the struggle against Apartheid) they shout, "Viva ART! Viva!". It usually is "Viva ANC! Viva!"
We are in the Phomolong clinic, 200kms north of Bloemfontein, in the Northern Free State town of Henneman, part of the once-productive Gold Fields. This is the middle province of South Africa, about the size of Uganda with large commercial farming and mining the mainstay of this economy....." Trip Report: The story of community struggles and public health delivery of antiretroviral therapy in the Free State Province of South Africa, Emdon H.

The above was the first project for this connected "suite of projects", and from the interviews and documentation there have been some very significant developments (which sadly are not alluded to on the CA or IDRC websites). The ART project led to a greater understanding of how information silos exist for each disease. TB health information was kept separately from HIV/AIDs information. These systems being different between hospitals and between districts. Patients records are incomplete and therefore treatment can be inefficient. This realisation led to the Medical Research Council (MRC) stepping back and investigating an open source health management system. The result is a project on OpenMRS, brokered by IDRC although not directly funded by CA.

Abstract published paper :- "OpenMRS (www.openmrs.org) is a highly configurable open source electronic medical record system focused on developing countries. An international collaboration of individuals and institutions is contributing to developing and extending the

core application and a network of implementers is configuring specific implementations of OpenMRS for treating and managing care for patients with HIV/AIDS and tuberculosis at sites in Eastern and Southern Africa. Support is critical for successful implementation and an OpenMRS implementers group has been formed driven by developers of OpenMRS with initial implementers from Kenya, Rwanda and South Africa and pilot implementers in Lesotho, Malawi, Tanzania, Uganda, and Zambia. The OpenMRS implementers group not only provides a first line of support to other implementers, but also performs functional testing and documentation. Support for local customisations is mainly provided through the OpenMRS Wiki, forum, and two e-mail mailing lists. The mailing lists are fairly active and responsive to issues arising during implementation, allowing a reasonably high level of support to be maintained for specific incountry implementations, and are supplemented with regular implementer meetings. Three meetings were held during 2006, in Eldoret, Cape Town and Dar-Es-Salaam. The first meeting of 2007 will take place in Mali during the Helina 2007 conference. http://www.mrc.ac.za/conference/satelemedicine/Seebregts.pdf

From the interviews and documentation it seems that OpenMRS was initiated at a project in Eldoret Kenya, and after a visit by the MRC, OpenMRS has been taken up and championed by the MRC as described above. While this relates closely to the experience of the ART Rollout, it must be noted that the Free State (which implemented the ART project) has a proprietary MIS which it is currently comfortable with, and the OpenMRS is being piloted in KwaZulu Natal which had a number of different MIS systems scattered throughout the State and therefore was more open to exploring the effectiveness of an open source MIS.

The support for the collection and management of data and for the software for the management of such data, are both significant research and learning projects. Implemented by the respected MRC they have been integrated into the Province-wide health care, giving an effective implementation and scaling and securing the "buy in" of Province wide services that could be taken up at national level, although the policy environment in South Africa remains difficult to navigate concerning Antiretroviral treatment. They potentially contribute enormously to this emerging area of MIS in health.

The interviewees on this project were enthusiastic. The ART project has given the health sector very significant data about the role of ARVs in the control of HIV. " Of the 26 000 patients registered on this system, approximately 5 500 are being treated. The province estimates it has 400 000 infected citizens. According to the data collected in the Free State, of those that started the treatment 75% are alive and in care and testify to these “Lazarus” drugs literally raising people from their deathbeds.. The results show that anti-retrovirals are extremely effective, as effective as in a developed country, but the treatment is not reaching enough people and many patients are dying while waiting for treatment." (extract from a piece written by the Programme Officer and project partners for Canada’s Governor General’s blogg during the GG’s visit to South Africa). And the MRC is also enthusiastic about the potential of OpenMRS in bringing about a patient orientated coherent, cost effective, information system.

This cluster of activity around ART rollout, health management information systems MISs and health management would seem to have some similarities with the Uganda Health Information Network. However, the distinction is that while this project has been developing electronic medical records, that is at patient level, the UHIN works with aggregated facilities based information for district level. Although the partners were invited to interact, this has not led to any significant outcome. For the future the Acacia team has plans to work on the interoperability and integration based on open standards of various open source applications seeking to “bolt them together” to support health informatics for entire public health systems. This illustrates one of the benefits of the CA programme being managed by the same team as Acacia.

5.4 AVOIR Uganda, Kenya, Mozambique, South Africa

Website:- "AVOIR brings together nine African universities to establish a virtual "center of excellence" for developing Free and Open Source Software (FOSS) that can help address African development issues and create African business opportunities. AVOIR is initially focusing on software for education, but over time will develop expertise and best practices in FOSS development and deployment that will be applicable in many sectors." http://www.idrc.ca/acacia/ev-86445-201-1-DO_TOPIC.html We note that a further 5 universities have been added after the start of the project, although this is not reflected on the website.

AVOIR has been championed by Derek Keats of Western Cape University. The focus of efforts has been on developing an open source elearning platform called variously kewl, KewlNextGen, and the just about to be launched version – Chisimba. While the objective was on developing software engineering skills in African universities, the emphasis on the elearning platform has made some groups consider this more an elearning project.

"The next generation of our Learning Management System (LMS), KewlNext.Gen (KNG) was first launched in January, 2005 by the Minister of Science and Technology Mr Mosibudi Mangena at UWC. Its development had been going extensively in 2004, although its conception and inspiration was derived from KEWL 1.2. An E-Learning Division was established in May 2005. It is the responsibility of the E-Learning Division to ensure that academics understand the importance of ICT in education and how it can be used to enhance their face-to-face teaching and learning. The E-Learning team has developed a training programme in order to ensure the successful implementation of online courses in KNG. The Instructional Design team of the division started training on the system in September 2005. Since then they have trained a number of lecturers on a voluntary basis across all faculties." http://kewl.uwc.ac.za/index.php?module=splashscreen

According to the interviews, the Western Cape has built a team of engineers who have gained valuable capacity in software engineering. While Mozambique has spent time in localising Kewl, and Uganda has contributed in part, it seems that the Western Cape team have contributed over 90% of the coding. There have been encouragements in the networking aspect of the project, but at the same time there has been a wide spectrum of contributions and involvement. Some universities which had signed up for AVOIR have made virtually no contribution, and there is a gradual and natural refining of who is involved and who drops out.

In terms of the output of the elearning platform – there seems to be a mixed response. In Mozambique, a number of departments in UEM had investigated Blackboard (a proprietary elearning platform), and wished to move ahead with it. The Mozambique AVOIR team felt they could not support Blackboard and encouraged the interested departments to wait for a stable version of Kewl. Kewl however requires its own server, which the university could not afford, and therefore although some software adaptation had occurred, a stable version for use within the university has yet to be implemented. Sun Systems is willing to donate 6 servers, and it is possible that such servers may be available to participating universities within a few months. Chisimba the revised version of the platform may also be available within a month or so. This project may see a sudden leap ahead in terms of assisting elearning within universities.

However it is important to draw attention back to the purpose – which is to develop a network of software engineers. The elearning platform provides a backdrop against which to have dialogue and share coding tasks. The elearning platform could potentially evolve into other applications.

It was not clear whether software developers in AVOIR join in the forums for OpenMRS.

5.5 ICT Incubators (Mozambique + Uganda Incubators) Mozambique, Uganda

As AVOIR works to build the capacity of software engineers, CA potentially complements these activities with ICT incubators, building viable businesses around software and hardware development.

Website:- *"Housed in a converted warehouse next to the Centre for Informatics at the University Eduardo Mondlane (UEM) in Maputo, the Mozambique ICT Institute (MICTI) - Technology Incubator is helping a new generation of technology entrepreneurs access the resources and skills they need to launch successful companies. By nurturing entrepreneurial skills and helping fledgling ICT companies get off the ground, MICTI will create employment and generate wealth in a sector of the economy critical to Mozambique's future."*

The MICTI project in Mozambique has so far incubated 5 businesses. In the 2005 evaluation it was noted that :-

- InforMovel and e-novar - These two businesses did not succeed.
- Real Soccer - The original business plan/concept for Real Soccer was flawed. There were too few web enabled people in Mozambique to make a web media business profitable. In addition, the electronic banking infrastructure is not developed enough to support browser side revenue collection. The business is being repositioned in the electronic marketing space, initially focused on tactical SMS based events, migrating to full service database marketing and electronic communications services.
- DDJ Law Online – DDJ law Online has domain expertise within the field of intellectual property and has an excellent track record. This business should not have made it into the incubator as they were not strictly an ICT product. However, their inclusion in the incubator has provided support the registration and incorporation of the new and existing incubants.
- Webcom - The original business concept was to develop a search engine for local content. This evolved into a web development and web hosting business. They make use of open source development tools and they leverage the University licensing arrangements to keep their costs very low. They support the web servers and technical environments.

While two of these are ready to "fly the nest", a recent evaluation suggests that their continued presence in the incubator would benefit to the other businesses – for instance they undertake server maintenance as a part of their rental contribution.

From the interviews and documentation, in the context of the widespread poverty of Mozambique, the Phase I incubator businesses are perhaps not very impressive. However, at the time of visiting there was a lot of interest in the MICTI innovation. The former Head of department had the idea of MICTI, and has since become Minister of Science and Development. The government has developed plans for a Science park, and many of the Board that supported the startup of the MICTI are on the committee for the Science Park. Recently the University has secured an old army barracks into which it is expanding MICTI. At the same time other parts of the barracks will host the start of the Science park.

The recent evaluation notes:-
"There is no doubt that the Mozambican government is supportive of the MICTI ICT Incubator. However, it is also clear that the Mozambican government is under pressure to fund more basic services such as civil engineering projects related to infrastructure. Therefore, it is my opinion that without the financial support of donor funders, the MICTI project would not be sustainable.

In fact, it is my conclusion that the IDRC in particular continue in its role which is largely fulfilling the obligations of the Mozambican government. The roles and functions that need to be fulfilled include:

1. Funding
   a. Operating costs
   b. Growth capital for incubants
2. Overseeing academic and industry co-development
3. Identify and investigate technology and industry themes against which the MICTI Incubator should be populated."[1]

While the 5 business incubations may seem modest, the role of MICTI in assisting the government to formulate a science and business strategy should not be underestimated. MICTI has provided a focus for discussion and thinking, that has enabled many key actors in the Science Park to develop their thinking (Board members of MICTI who are now involved in Science Park development).

The near future will provide some interesting insights. MICTI management have brought in Mark Davies for a consultancy on how to take MICTI forward. Known to the reviewer, the experience of Davies and BusyNet in Ghana has been that a well connected internet cafe became a place where young entrepreneurs naturally gathered and swapped ideas and supported each other. Formalising this arrangement, BusyNet created "incubator space" hosting small cubicles which could be allocated to developing businesses. But the isolation of the dedicated space, and the need of young Africans to juggle many means of income, education and family obligations has meant that BusyNet has gone back to encouraging a single "chaotic" open space. At the moment the MICTI design is individual cubicles, although the evaluation suggested "chaotic space" might be more useful. (When the reviewer was there, and keeping in mind this is a very small snapshot, the MICTI incubator businesses were not staffed – and interviews with incubator businesses were short due to the young entrepreneurs having "other things to do").

Similarly in Uganda, an incubator has developed businesses with a similar MICTI model, some of which are sponsored by IDRC. A discussion with the manager of the incubator revealed similar challenges as Mozambique, and similar successes.

5.6 PAREN (UbuntuNet Alliance) Uganda, Kenya, Mozambique, South Africa

Website:- The goal of the project is to decrease the cost and improve the quality of bandwidth access for African universities. Through establishing low cost high quality networks, a platform for generative discourse can be created leading to improved policy advice, more effective cross pollination of best practices and lessons learned as well as encouraging an affinity towards cost sharing and partnership engagement models. Addressing the bandwidth challenges currently faced should lead to an increase in African research material on the Internet, improved educational standards of African universities, increased access to publications and increased collaboration and partnerships among individuals and research institutions.

The PAREN cluster of projects and activities seems to address the very real need of universities to gain better access to bandwidth. A recent map demonstrates spending on tertiary education in Africa (http://www.worldmapper.org/display.php?selected=211); it also demonstrates how important it is that resources are used effectively and that attention is given to African higher education if economies are to grow.

[1] MICTI ICT Incubator Evaluation Report October 2005 "From War Heroes to Business Heroes"

Working with various networks the reviewer would see it as a significant success in terms of networking and stimulating cross continent co-ordinated action. In brief, universities coming together in each country have discussed the various options for gaining higher bandwidth. From interviews it seems that at one point the focus was on the EASSY cable, and the universities became a focus for the open access approach championed by certain donors. The discussions about EASSY became increasingly complex, and there now seem to be 4 propositions for significant East African connectivity – the commercial EASSY cable, a Nepad led open access cable (that may or may not be the same cable as EASSY), and two possible options for Kenya, the TEAM cable (Kenya Telecom led), and possibly a KDN cable. There have been considerable delays due to the complexity of the discussions and the final outcomes are not yet certain.

However, whatever the final outcome, the involvement of the universities provided one of the key focal points for discussions - about who should be included, how could they be included and what were the principles of open access. From one angle the involvement of the networks in the discussions gave "ammunition" to the donors to strengthen their case for open access. Open access proposed a business model that prevented the commercial players from creating price distortions that locked out smaller players and fixed prices that were, in the view of the donors, detrimental to national economies. While the project played a relatively small role in the discussions, the involvement of the CA team and the alliance made with other donors such as DFID (UK) through Catia, it can be said that the project played a significant role. The outcome remains uncertain; however, the potential benefit could be to the whole of East Africa in terms of the price of bandwidth.

It has also resulted in the UbuntuNet Alliance.

Website:- "UbuntuNet Alliance has been established to capitalise on the emergence of optical fibre and other terrestrial infrastructure opportunities and thus become the Research and Education Network (REN) backbone of Africa! Tertiary education and research institutions throughout the rest of the world are connected to the Internet using fast low-cost fibre. This gives them a huge research and learning bonus. Until now, most of Africa has been missing from this connected world. However, this is changing with the emergence of UbuntuNet Alliance which enjoys close linkages with the Association of African Universities and the regional higher education bodies. Established and emerging NRENs (National Research and Education Networks) in Kenya, Malawi, Mozambique, Rwanda and South Africa have come together as the Founders of a new grouping: the UbuntuNet Alliance for Research and Education Networking. The vision of delivering very high speed - gigabits (Gb/s) connectivity instead of the current kilobits (kb/s) between African Universities and Research Institutions is driving the Alliance forward at a rapid pace. The UbuntuNet Alliance is registered as a non-profit association of NRENs in the Trade Register of the Chamber of Commerce and Industry of Amsterdam."

This is a very solid long term outcome of the IDRC involvement. UbuntuNet Alliance has a momentum that should see it into the future. It has the capacity to adapt to the rapidly changing context of African connectivity, and be able to assist higher education institutions to get the most from whatever is available.

5.7 FMFI Mozambique, South Africa

Website:- First Mile, First Inch (FMFI) is a multi-disciplinary network of projects exploring the technological and social consequences of low-cost telecommunications implemented in remote schools, clinics, and telecentres. As well as developing applications, research teams are exploring how people interact with the new technologies and how their daily lives may be changed through such interaction. Project leaders intend to demonstrate how the "first mile" in poorly served rural and marginalized communities can be bridged with WiFi and innovations such as power line communications, as well as off-the-shelf, consumer technologies. To allow

users to easily interact with computers (the "first inch"), FMFI will develop open source, easy-to-use applications in local languages.
http://www.idrc.ca/acacia/ev-86357-201-1-DO_TOPIC.html

The project has indeed been able to implement a number of different scenarios involving WiFi. This was a very experimental programme of activities, and the Acacia external review made the following observation:-
"Still at a relatively early stage, this is an interesting combination of technological action research with a strong social research aspect. It also incorporates the principles of networking across a region for mutual support and longer-term sustainability. The network has yet to fully gel, but there is active progress towards being a real network. The social research seems to have been embedded from the start. The innovative aspect of the projects is strong, pushing back the frontiers of technology use, both in terms of innovation of the technology and in terms of using technology in difficult environments. Strong emphasis on dissemination and research publication."
http://idrinfo.idrc.ca/archive/corpdocs/122115/39236-39238.pdf

As part of the review, a visit was made to the Manhica telecentre in Mozambique. This telecentre was connected by WiFi to the municipal and district offices, in order to share the costs of connectivity. The telecentre implemented standard training, and one of the people attending the centre at the time of the visit was a government employee in agriculture who said that he was learning basic computing in anticipation of his offices getting a computer and connectivity.

FMFI have pushed the boundaries of connectivity by WiFi. They have demonstrated that significant distances (10Km plus) can be covered, and that it is possible to connect a number of institutions sharing the costs of connectivity (eg several schools working together). Experience of different institutions sharing connectivity has provided valuable lessons on user profiles, technical constraints, operation and maintenance, and cost effectiveness.

This project is partly CA and partly Acacia, and as such was assessed during the Acacia External Review. At that time the project was just starting and this review team requested to include it again to be able to see the longer term outputs.

The Acacia External Review stated:- "This relationship can be best illustrated by the case study of FMFI. Approximately CAD300,000 comes from CA, while CAD770,000 comes from Acacia. The combined result is a networked program that builds capacity in Africa in both technological pioneering and collaboration. The innovative nature of FMFI (mesh networking, power line communication) fulfils the innovation theme of CA, and yet also continues with that Acacia traditional role as a pioneer and leading edge on ICT4D. The collaboration between the researchers in FMFI fulfils the theme of CA "R&D and African ICTs" (involving universities and researchers in three countries of southern African), at the same time fulfilling the Acacia theme of building African research capability. It presents a contribution to CA "Regional ICT Futures" in that FMFI is encouraging the three countries to co-operate and form linkages, while it fulfils the networking aspects enshrined in the Acacia strategy. The added value of Acacia, over and above the targeting of CA themes, is the focus of FMFI on social research. As described in the case study, the addition of outcome mapping (and its evolution as a research tool) has contributed to technological action research being a vehicle for documenting and researching the impact of that technology on the social context of each project - the human changes in behaviour. Many of the partners of FMFI are the Acacia traditional partners (telecentres, Schoolnet Mozambique) but the emphasis on networking and social research has built on previous work adding aspects that enhance the actual use of the connectivity."

While the project has had a strong technology focus, there were hopes that FMFI might provide a platform to influence policies in this arena. In South Africa, the researchers tend to be

limited in their possibilities for direct policy influence – they tend neither to be well connected nor well suited to the "art" of lobbying. Where they could identify success was with the director of CSIR who on seeing the potential of the FMFI projects has championed their results in higher government circles. They could also identify that by pushing the boundaries of the current law they were demonstrating the need for policy change. They also noted that presentations to Industry Canada seemed to leave the visitor "impressed". Most importantly it should be noted that the project is not yet completed and there are publications and activities planned which are specifically targeted at policy makers.

Again, while the suite of projects has provided valuable insights into technical difficulties, the researchers have had their capacity to consider the social side built through the workshops, outcome mapping exercises and strategic discussions. One example of how initially the plans did not necessarily include social factors is the subproject proposing to connect nurses in a clinic to doctors several kilometres up the road. The project encountered difficulties because the public nurses did not want to consult with the faith based doctors. However, as the project has progressed researchers have become increasingly aware of the socio-economic context of their work.

At the start of the project many of the engineers involved found it a challenge to discuss their projects in terms of the social factors and outcome mapping. The initial workshops presented some insights, and blogs such as Dwane Baileys document the "revelation" he experienced during the outcome mapping workshops. However, in practice much of the detail of outcome mapping was not necessarily followed through. Diaries were not kept, and gradually the actions associated with outcome mapping defaulted back to the team leader and his colleague. They conducted most of the interviews and they wrote up the reports. The observation is that there was considerable learning regarding how social factors influence technically innovative projects.

FMFI has purposely explored the limits of some new technologies – however, the uptake and scaling of such technologies is much more dependent on the social, institutional, and economic context. For instance, there is already evidence of the market leading towards a growing uptake of WiFi technologies. Whether these become mini private networks, or whether they are connecting schools and district government offices, will depend not on the technology per se but on whether the institutions are willing to cooperate, whether everyone pays their share of the costs, whether legislation allows such connections, whether there is the human capacity to install and maintain such mini networks. These factors will be very strong in replication and scaling of the FMFI innovations. For instance FMFI has demonstrated that several schools can be connected over significant distances, and share a VSAT. This is currently operating and being seen as quite successful in the FMFI context. In Kenya similar schemes have been applied, only to find that one or two of the schools in the longer term have not paid their bills – the other schools not wanting to subsidise them, the VSAT has remained unpaid and eventually gets cut off.

5.8 Computers for Schools Kenya (CfSK) Kenya

Website:- "Computers for Schools Kenya (CfSK) is a not for profit organization whose objective is to provide Kenyan youth with greater access to Information and Communication Technologies (ICT) and to enable them to participate and succeed in the knowledge based economy. The first two phases of this project concentrated on the development of a community driven model where local companies invested their used computers in local schools in Kenya. Secondly, the project was able to develop the technical capability of Kenyan teachers, students and therefore enabled them to repair and manage their own computer inventories."

From the interviews and documentation, this project has made a significant impact on Kenya. It has demonstrated a model that can work, and the government of Kenya speaks very highly of it. In terms of Kenya's new ICT policy it fits well, and it fits with overall government plans.

Perhaps typically this praise is not yet translated into government financial support, but given the politics of Africa this is not too surprising. An interview with the Minster of Education stated that they wanted to see several CfSKs rising up, offering schools a reliable service.

It is worth comparing, and contrasting, the CfSK project with recommendations from an early study on refurbished computers. Widely reported has been a study conducted by SchoolNet Africa (SNA) disseminated in 2005. It made the following statements:-

"The experience of SNA and its partners in seven African countries who were involved in the study shows that:
* Approximately 20% of second hand PCs shipped to African Schoolnet organisations are faulty and not re-usable.
* Donors largely confine ICTs support to supplying PCs – rather than ensuring donated PCs are installed in good working order for an affordable price.
* Refurbishment is mostly done by international non-governmental organisations (NGOs) based in industrialised countries and not within Africa.
* Most projects have been unplanned – little has been done to develop ICTs capability (both technical and educational) in schools.
* Schools report receiving many different makes and models of PC – some without operating systems or educational software.
* Only a few second hand PC providers have evaluated the effectiveness of their work"

They go on to recommend the following:-
SNA argues that future projects must be consistent, scaleable and coordinated. Streamlining and improving the supply pipeline requires:
* developing refurbishing and maintenance skills in Africa
* coordinating international PC donation schemes - sustainability is reduced where there are multiple providers in each developed country
* taking action to build in-school ICTs capacity
* including the cost of shipping, import duties, local transport, installation, maintenance and disposal costs into the cost-benefit analysis of importing second-hand PCs.

If we now consider the CfSK model in this light it compares very favourably. It prechecks its suppliers – ensuring that only computers that exceed a minimum specification are sent. This reduces its drop out rate to about 5%. The whole rationale of the CfSK model is working computers in schools adequately supported – not just PCs dumped in a school. Refurbishment is conducted by CfSK a local NGO within Kenya. It delivers 20 PCs to a school, justifying training of teachers in basic computer care and developing ICT capability in schools. It ensures that operating systems are installed and that the computers have a minimum of software. It has developed refurbishment and maintenance skills in Africa – indeed it goes one step further setting up local maintenance sites. It has co-ordinated its suppliers. It does build in-school capacity.

Certainly the CfSK model seems very comprehensive. Taking selected refurbished computers it can install, train local teachers and in the main provide localised maintenance. When the life of the computer is finished it has arranged an impressive ewaste management, selling some materials back to China, others locally, and turning items such as monitors into televisions.

It is currently working with neighbouring countries such as Uganda to replicate itself. It recently received a positive evaluation from a Ugandan consultant, who is now seeking to assist replication into Uganda.

Some questions were raised by interviewees about the sustainability of the institution, not in terms of funding as such, but in terms of the key role of Tom Musilii. Tom is a typical pioneer,

one who has faced tremendous challenges to start and build this project/institution and as such the organisation may currently be dependent on his vision and skills. The sustainability would seem to depend on tangible government commitments and organisational capacity building.

CfSK had also recently started a sub section of its work, developing curriculum content for both a basic Kenyan adapted Computer Driving Licence, and for other Science subjects. This had brought it into conflict with the Kenya Institute of Education (KIE) which has the mandate from the Ministry of Education for curriculum development. CfSK argues that their work is based on the curriculum set by the KIE, and that they are just digitising it. The review team noted that other players in the market were offering digital content for Kenya, but on examining the offering found that it had not been localised, was proprietary and potentially expensive for a school unless subsidised.

5.9 JuriBurkina and RIJA Burkina Faso, Niger, Senegal

Website:- Building on expertise and software developed at the Public Law Research Centre at the University of Montreal, JuriBurkina is a searchable, French-language database that makes available to anyone with Internet access a repository of Burkina Faso's laws and legislation. Before JuriBurkina, law practitioners had difficulty accessing this information, which was housed in several locations. JuriBurkina was developed using open source technologies and shareware that can be re-used in other West Africa countries to create similar online legal repositories at a low cost, leading ultimately to free online access to legal information throughout the region.

The project's key goal is to support Burkina Faso to becoming a model State in the matter of the dissemination of its national law. For this purpose, JuriBurkina has established a legal information institute. Besides putting the national jurisprudence on line, it provided users with specialized documents, which are sometimes necessary for online research particularly concerning legal practice and resources.

From the interviews and documentation it can be seen that the project's objectives have slightly changed. This adjustment became necessary due to the restricted connectivity capacities of possible users.

The project's initial objective was to establish a legal information institute online through the use of freeware. But as many users do not have internet connection it also sought to create access points. JuriBurkina has provided an access point for users in the Lawyers association building. Using funding from the EU, the centre equipment has increased from 2 to 11 computers in 2006 with assistance from LexUM.

The JuriBurkina website is available and operational. Approximately 800 decisions are available online. These decisions are provided by jurisdictions signatory to the agreement protocol for decision collection before October 2006. The site is visited by students and lawyers, as well as the public. The use of the site is variable but from the interviews it seems it is well appreciated by users.

Achieving the project's objectives depended on the stability of its national (LA, ZCP, SGG) and international (IDRC, AIF and Lexum) partnership network. This in turn depended on the strength of the network of freeware users for a free dissemination of law (lexEDO).
With the close cooperation of four national stakeholders and thanks to Lexum technical support the interviewees felt that the project produced some potentially important changes in the behaviour of lawyers.

RIJA, which is just starting, is a project aiming to establish local initiatives for law dissemination in African countries. This project has come out of JuriBurkina and the interest demonstrated by most of the presidents of bars from OHADA member countries. In a first

phase, RIJA will gather future LIIs in Senegal, Niger and Juriburkina. In the project planning it was thought that some support would be provided to the Légis national centre in Madagascar. However this objective was abandoned due to the lack of trust between Lexum and Légis centre. Currently, only one component of the project is continuing; the spreading of legal information in Senegal and Niger.

In Senegal, projects for law dissemination and assistance to jurisdictions already existed. They were funded by the French Cooperation. A decision database which can be updated in Jurisen (also approved by AIF) was then established. In the last three years, all jurisdictions have been made using computers. Jurisen is a part of the justice sectoral project (to which it comes as a supplement). It is a French Cooperation funded over ten years. However, RIJA has not been able to start its activities in spite of the commitment of the Lawyers Association to host it in their premises as the site was already designed by ZCP.

As for Niger, the president of the high court of justice of Niamey (centralizing 80% of judgments i.e. 730 judgments per year) has already handed over to the project manager 1500 judgments from the civil clerk's office in the MS Word format. Numerous legal resources are also available. They come from two courts of appeal collected in the context of an abortive project of the French Cooperation. In Niger the issue of anonymity seems less of a challenge than elsewhere, and the hosting of dissemination infrastructures by ZCP does not present a problem.

5.10 ECA (PICTA, CA) Ethiopia, Uganda, Kenya

Website:- Partnership for ICTs in Africa (PICTA) is an informal group of international agencies that is addressing a major development challenge: coordinating and aligning the many Information and Communication Technology (ICT) for development activities in Africa to ensure that development resources are being used effectively. PICTA was created in 1997 and is sponsored by the United Nations Economic Commission for Africa.
http://www.idrc.ca/acacia/ev-86387-201-1-DO_TOPIC.html

From the interviews, the relationship with ECA and with PICTA seems to have been mixed. On the one hand ECA has added value to the partnerships by convening donor meetings, and IDRC has added value to ECA by seeking their involvement. However, on the other hand the relationship has been tantalisingly unfulfilling. ECA has not been able to engage as much as it would have liked, because it was not given sufficient responsibility – it might have preferred funding and projects for which it was responsible. It has its own priorities and this has meant that its senior personnel have not always been available for CA steering groups meetings, or for input to the project design and implementation.

Regarding PICTA, PICTA stumbled for a while in 2005 when UNECA got involved with a number of other activities and struggled for sufficient personnel resources. It regained a life in late 2006 and remains an informal network of donors, and can potentially provide a platform for dialogue.

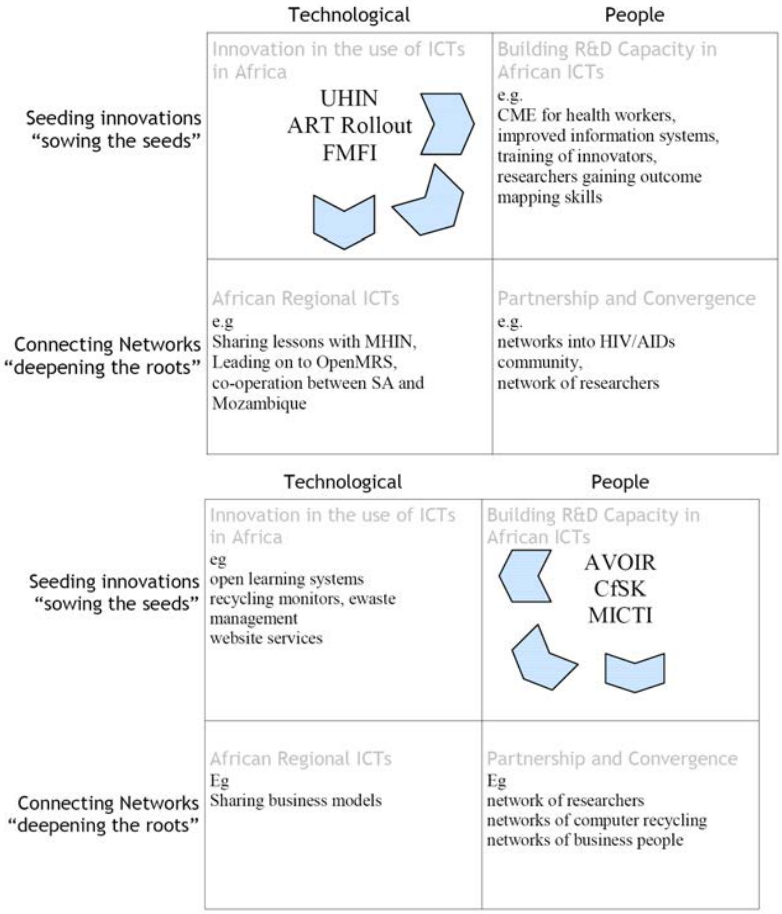
An appendix presents brief details for four other clustered case studies. Most of them have just started or they are small projects. They are sometimes referred to in the analysis below.

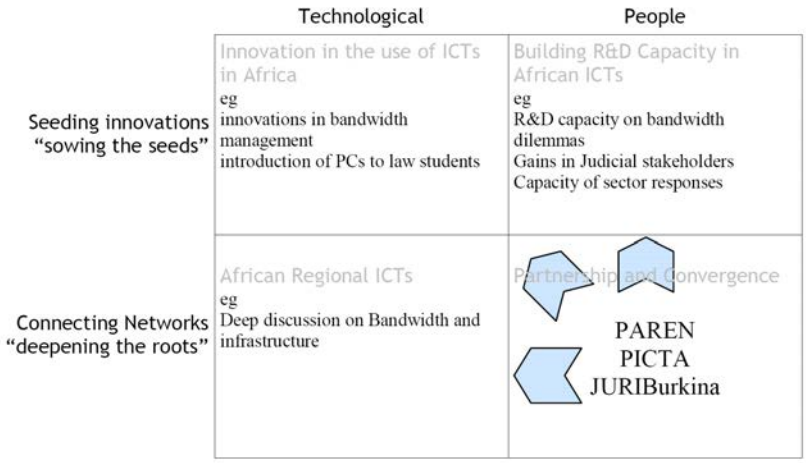
6 Analysis

6.1 Thematic Matrix

Returning for the moment to the thematic matrix, it is interesting to map the case studies onto the matrix. In each of the following the cluster case study name is placed in the quadrant it was assigned by "administration". The arrows and the brief examples illustrate how the case study has contributed to the wider programme, and the CA programme themes. In all cases but to varying degrees a project is not restricted to one themed response. For instance the technological innovations are always accompanied by capacity changes in people.

The following diagram illustrates how each of the cases "reaches" into the other themes.





A fourth diagram has not been presented, as of the case studies only the Wireless Capacity project was designated in the Regional ICT quadrant.

From the case studies, which are in themselves a good representation of the programme as a whole, it is clear that CA has addressed the themes. Connectivity has not been a technology orientated programme. It has been a balanced mix of technical and social innovation and network building. It has built the capacity of people at various levels – at university level among the IT literate, at national level among policy makers, and at district level among field workers and teachers. This balance of emphasis on technology and people is a considerable strength of the programme.

7 TOR objective 1 -- Assess the extent to which the program is meeting its objectives and aims

The following are the breakdown of Impact, Outcomes and Outputs as described in the Project Implementation Plan.

7.1.1 Impact

- Increased participation by Africans in the information society through better adapted and lower cost tools
- Empowered African communities with information to solve their development problems
- Strengthened African capacity to speak with a common voice in international fora on ICTs
- Increased participation by African women in the information society

It is clear from the case examples of AVOIR, PAREN, OpenMRS, and the various Wireless trainings and experiments, that there has been increased participation by Africans in the issues of the information society on their continent. They have been able to discuss and take action over regional issues through PAREN, and they have participated in Open Source software development in AVOIR and OpenMRS. Through its links with Catia and Acacia many of the CA partners have actively lobbied to influence ICT Policy.

With CfSK, ART and JuriBurkina there are three examples of Africa using ICT to enhance its development activities. CfSK has been acknowledged by the Government of Kenya as having made significant contribution to ICT planning in Education in Kenya, ART in Free State has enhanced the health system, and JuriBurkina has tackled some corruption and transparency issues. While each of these forays into development are imperfect, they nevertheless have demonstrated the potential of African designed problem-solving using ICT. It should be noted that the implication of the statement "Empowered African communities...." is that the projects touch the lives of rural village communities. While the wireless activities have the potential to enhance access in rural areas, these technologies have not yet reached scale. The main impact, which is empowering African communities, is on communities of interest within Africa and African institutional efficiencies. Empowering professionals to deliver more effectively services to rural communities, and empowering professionals to solve their development problems.

In terms of the regional issues, CA has cultivated networks and partnerships that can speak into international connectivity issues. The involvement of PAREN and ultimately UbuntuNet Alliance in the fibre optic cable debates has been strategic as described above - "This (the UbuntuNet alliance) is a very solid long term outcome of the IDRC involvement. UbuntuNet Alliance has a momentum that should see it into the future. It has the capacity to adapt to the rapidly changing context of African connectivity, and be able to assist higher education institutions to get the most from whatever is available."

There has been a contribution of African Women to the whole. The UbuntuNet Chairperson is a woman, and the lead for the Nakaseke Telecentre Wireless expansion is female. There has also been one small project, Capacity Building for Women Engineers: Africa NETWORK OPERATORS GROUP and LINUXCHIX AFRICA WORKSHOP. But as a systematic theme identifiable throughout the CA programming, a focus on encouraging a change in gender roles has not been particularly evident. This statement needs to be held in context – The CA programme and the Acacia PI are both implemented by the same team. As such, there has been a mild mindset that it is one programme. Acacia has undertaken significant applied research regarding the participation of African Women in the information society eg Grace.net and Régentic. While these projects do suggest that the team are gender aware, nevertheless there does seem to be a lacking of gender awareness as a cross cutting theme in all the projects.

7.1.2 Outcomes

- Sustainable and early adoption of innovative ICTs by African institutions
- Regional ICT traffic in Africa improved through an established Internet exchange point
- Strengthened capacity in African institutions for innovation and research in ICTs through an established a robust African university network
- Strengthened capacity of Africans to act collectively and share knowledge through improved regional linkages
- Increased participation of women in African research and innovation in ICTs and sharing of knowledge

Early adoption can clearly be seen in many programmes, but the word sustainable needs to be handled with care. Many of the projects were very early adopters of new technology, and as such the teething problems are not only the technical but the socio-economic challenges as well. For instance, UHIN struggles with both technical and wider contextual challenges - the WideRay Jacks used in the early part of the project have been unable to keep up with technology changes, and by being proprietary cannot offer the flexibility the project now requires. At the same time, the political context for the project has meant that even if proven to be technologically sound, the proposition may not be sustained and scaled.

National Internet Exchange points have been strengthened. The African Regional Internet Peering Points project which was not one of the case studies and has not been discussed in detail could have been key to this particular indicator. It had some difficulties, and did not yield the data it intended to (due to project delays), although did deliver some helpful discussion. However, the CA programme has worked closely with Catia in this respect, and the combination has resulted in some clear deliverables regarding IXPs (14 countries with ISPA's and 13 countries with IXP. These national points are positioned to maximise regional connectivity as and when regional connectivity develops.

Again, the contribution of CA to both the development of institutional capacity to understand connectivity, and to influence it, is quite clear. Networks and alliances have been formed that are able to respond to the changing climate, and the future looks bright; academic institutions will be able to make the most of regional connectivity as and when regional connectivity develops.

As above, the capacity of Africans to act collectively and share knowledge through improved regional links is already a tangible reality, as key stakeholders talk to each other, the improvement being in the social connections rather than the electronic connectivity. It is also a likely future reality as actions of the CA programme have mobilised key players to work together to improve and make best use of future improvements in digital connectivity.

It is not to be dismissive of an important subject, but direct action addressing the gender balance of the digital society did not necessarily fit with the more innovative elements of the programme. IDRC through its Acacia programme has undertaken direct actions that address gender imbalances – such as the Grace Network of research. Connectivity Africa staff show a general awareness of gender issues, but almost none of the project partners interviewed broached the subject, nor could easily answer how they specifically addressed gender imbalance. Once the subject was raised then stakeholders were able to articulate their intentions, however project reporting also does not seem to suggest that gender is a "top of mind" subject.

The following picks up on the outputs from the implementation plan. These are not quite the same as the four strategy areas that were adopted by the team, and became the mantra of the programme. Nevertheless this section seeks to examine the work in the light of these original

outputs as a part of answering the question as to how programme objectives evolved over the life of the programme.

7.1.3 Outputs

1. Innovation in the Use of ICTs
    - Potential ICT users are made aware of low cost alternatives for Connectivity
    - African people are trained and capable in the use of new technologies
    - Africans are exposed to innovative uses of ICT
    - Analysed and disseminated viability of new technologies in African context

There has been a very strong exploration of low cost alternatives for Connectivity. Innovative application of emerging technologies features in many of the projects. For instance, the use of wireless connections between institutions to share the cost of VSAT is a potentially very important low cost alternative. Commercially Africa is beginning to see hot spots being created around the fibre backbone, and there are plans within Kenya for advert driven WiFi access being made available extensively throughout the country. If this occurs, Kenya will be on the "one to watch" as to how this access affects the economy. However, access through commercial hotspots would have very limited impact if there were not low cost alternatives for extending the access. CA has been exploring WiFi mesh networks through FMFI, the wireless training programme, and other projects, and together this suite of projects has enabled the ICT community of Africa to build up a base of knowledge and awareness of this particular set of low cost alternatives to connectivity[2]. Similarly, the innovation has not just been the wirelessness. The refurbishment of computers by CfSK sets a strong precedent about how low cost computers can be provided for Schools. And their associated ewaste management sets a healthy precedent about the ewaste of Africa. Software development in AVOIR is potentially a low cost alternative to elearning commercial systems such as Blackboard. Open MRS, offers a low cost alternative for Management Information Systems.

Following the above suite of experience, the CA programme of innovation has been associated with appropriate training. Early experiments in wireless connection have grown into planned projects of networking and training around the low cost alternatives. A growing cadre of trained and capable people is becoming available.

Perhaps the weakest response to the above plans for this portion of outputs has been the analysis and disseminated findings, learning and experience of the new technologies. One can see dissemination occurring in for instance, the work of CfSK assisting Uganda and other neighbours. One can also see it in the learning around wirelessness and the publications. However, many of the innovative technologies are only just reaching a point where lesson learning can be consolidated and replicated, and even scaled. The CA programme was a short time span for such innovation to be tried, tested, freed from technical bugs, and disseminated. If Acacia picks up elements of the CA programme then dissemination will occur, but it would be beneficial to have funding for the next few years to take the lesson learning forward – more on this below.

2. African Regional ICT Futures
    - African/international Internet traffic has been analysed and data made available
    - Business model for African regional Internet Connectivity has been proposed to potential partners
    - Regulators are sensitised to pros and cons of regional Internet exchange

2 For example a technical challenge most relevant to Africa and not to Europe is lightning strikes! When you are the only metal pole around you tend to be fried by the next storm – in Europe where there is a lot of metal this is not a significant challenge.

As stated above, one actual project that sought to analyse regional IXP traffic data suffered from unexpected and unpredictable difficulties. However, on a more conceptual level there has been ongoing analysis of regional connectivity as a part of the involvement of various CA stakeholders and partners in the debates about fibre optic cables. The formation of NRENs as a part of Promoting African Research and Education networking (PAREN), and the coming together of those NRENs as UbuntuNet Alliance is a combination of this output and Output 4 below.

CA partnered with Catia in terms of the work on IXPs, and while Catia focused on national IXPs and the formation of ISP Associations, nevertheless the combined work of CA and Catia enabled regulators to become aware of the issues and to consider regional traffic. In the combination of CA and Catia there has been considerable strengthening of policy makers regarding their capacity to understand and regulate on internet exchange points.

Business models have been developed as a part of UbuntuNet Alliance, and indeed to some extent the discussions in Mozambique and Uganda about Science Parks and Incubators and FMFI, are a part of this looking to the regional futures of Africa.

3. R&D in African ICTs
    - ICT incubators are operational and providing support and mentoring services
    - African universities are benefiting from North/South, South/South partnerships
    - African universities have increased their ICT skills and knowledge

The MICTI services and the Uganda equivalent are two strong contributions to the incubator concept. In Mozambique particularly the political context has made the MICTI incubator important to long term government planning.

Much of the open source work has benefited from North South and particularly South South partnerships. However much more importantly has been the support for the SARUA networks which has led to discussions about bandwidth for academia.

While the sharing of coding among the AVOIR community has perhaps been less than hoped for, the very presence of the AVOIR network has challenged universities to explore how they can support software development and elearning. For instance, the department at UEM that is working with AVOIR and tasked with supporting elearning platforms is hampered by the lack of a dedicated server, and is waiting for the ChiSimba updated code. It nevertheless was clearly aware of the challenges of running elearning platforms and was able to articulate what skills were required. The capacity build has been significant – university management becoming aware of bandwidth limitations and finding resources to upgrade the connectivity, university professionals upgrading their technical skills and working to improve resource management, university academia exploring elearning and the associated pedagogy.

4. Partnership and Convergence
    - Collaborative networks are in place to support African communities
    - Donor collaboration in ICTs fostered through organizations like PICTA
    - Participation of African ICT stakeholders facilitated in global policy fora

As described above outputs 1, 2 and 3 have depended on partnerships, within national borders and across borders. In addition to the above, there have been specific partnership projects. Harambee has sought to support networks with a mixed response. Support for the UNECA has assisted it in relaunching PICTA with the buy in of a number of international agencies. CA made some strategic contributions to the WSIS preparations in Tunisia, and while WSIS may not be seen as a success by many donors and participants, nevertheless CA fulfilled its workplan of encouraging African participation in international fora.

5. Gender
    - Guidelines and resources on the integration of gender equality issues are made available

The reviewer was not aware of any gender guidelines attributed to CA funding. However, one must take into account that Gender is a strong theme in the associated programme Initiative Acacia. Acacia is managed by the same team as CA, and often actions that are discussed and itemised as needing to be done, may be funded from different funding streams.

It should also be noted that the implementation plan outlines the low starting point for gender activities in the IT sector. In addition to all the social and economic context for equality between men and women, involvement in the IT sector by women is low in the North. The implementation plan therefore argues that gender equality will be encouraged through Supporting Women to Create, Communicate and Exchange Knowledge. In this section the plan describes how women are the primary health care providers in their families – so action in the health sector will support women receiving timely, practical information. Similarly women and girls make up a significant part of the school population – actions that support education should reach women. And finally the implementation plan argues that non formal economic activities tend to be women led. Given this argument, we can acknowledge that UHIN has supported the health sector and implicitly supported the family health carers and CfSK has supported schools and implicitly opened opportunities for women and girls to explore computing.

However, if we examine this in more detail – MICTI has predominantly male entrepreneurs and did not discuss any criteria that might prioritise female applicants, almost all technical workers in CfSK were male and their installation of computers in schools will reinforce the subtle view that computers are a male domain. In the snapshot of the Manhinca telecentre, women students equalled their male counterparts, but staff in the centre were all male.

The CA programme plan proposed :- Training and information resources can be developed and made available to project partners and proponents, such as:

- Gender training workshops
- Literature reviews of the gender equality implications of the sectors and areas included in this project, including best practices and strategies on promoting gender equality through ICTs
- Resources on gender-sensitive and gender-appropriate training curricula and methodologies
- Strategies to support and encourage women-run SMEs with ICTs and women-run ICT enterprises, in technology development, procurement, enterprise development, and access to information and markets.

While these elements were available through Acacia funding, very few if any were made available through CA funding. However, again we must draw attention to the single management between Acacia and CA, and that actions proposed in one PI might be taken up in the context of another – with legitimacy.

7.2 Discussion of progress towards objectives

It is clear from the case studies and the above opening analysis that each of the projects has made significant progress towards their individual project objectives and since they were chosen against criteria representing the whole programme, they contribute to the programme objectives. The overall programme has seen movement towards the objectives. In the section below (TOR Objective 2), the logical framework created for CIDA is used to discuss the programme objectives in more detail.

The emphasis of the objectives is on African capacity. There are clear examples of how capacity has been built, and there are strong networks that should take the capacity into the future.

CA has been strong in it flexibility to adapt to a changing environment. ICT is fast moving sector and CA has had the required flexibility to respond, as evidenced by the evolution of the PAREN/UbuntuNet Alliance.

While the Connectivity Africa Programme Initiative was a special programme, and has not been previously reviewed, it is implemented by the same team that manage the Acacia programme Initiative. One would therefore expect some responses to the previous Acacia reviews to be seen in the CA Programme. Perhaps the most obvious lesson learned, which has indeed been applied to CA is the focus on networks and partnerships to provide for longer term capacity building and lesson learning.

Table 3 Assessment of CA against Acacia lessons

Acacia I lesson	Acacia II response	Re:- Connectivity Africa
Policy is key:	There has been evidence of targeting policy	Less emphasis on policy influence (as it was not a stated objective) – more on building capacity
Infrastructure and Technologies exist for difficult environments:	Acacia II continues to explore the abilities of technology in difficult environments	Specific exploration of low cost alternatives, regional infrastructure and futures
Content matters:	Acacia II has focused on capacity and software to develop content.	Content in both software development, but also CfSK has moved into curriculum and UHIN uses CME.
The Management of Community ICT projects is complex:	Acacia II has moved away from directly managing community ICT projects	Maintains distance from direct management of projects
Partnerships are important but elusive:	Acacia has prioritised partnerships and through networks has strengthened African partnerships	Strong emphasis on networks and partnerships – to the obvious benefit of the programme
Gender equity is difficult to attain:	Acacia II has specifically explored gender issues, e.g. Grace.net, Regentic, but it has found that gender equity is difficult to attain in the broad range of projects	Exploration of gender issues has been weak, although the team has had the Acacia projects Grace and Regentic to draw on, there seemed to be little evidence of cross fertilisation with the CA networks.
The introduction of ICTs must be seen as an ongoing process and participation is critical. The traditional IDRC participatory research approach continues to be relevant albeit time-consuming.	Acacia II has continued with and taken participation one step further by creating networks that can consult with each other.	CA is very much based on participatory models.

Acacia I lesson	Acacia II response	Re:- Connectivity Africa
The process of social sustainability of Acacia projects has been initiated. People have shown the willingness to use ICTs despite the noticeable constraints. To ensure financial sustainability, community members need to be involved in the research, packaging and the delivery of required information.	With the move away from action research Acacia II has not particularly prioritised the sustainability of options. However, in its applied research Acacia II has involved local researchers and thus encouraged a longer-term retention of capacity and a sustainability of networks and research outcomes.	CA very much developed and built on local capacity. Its foray into innovation has meant that some of the technical explorations may not be sustainable, however the overriding involvement of local researchers will leave increased sustainable capacity.
The Acacia approach of working with rural and marginalized communities in ICT facilities/projects is relevant in the current context characterised by the paucity of expertise and low incomes in most of the locations where Acacia (and IDRC) is active.	Acacia II recognised the change in environment and that working directly with rural and marginalised communities was not the best approach. It has moved towards applied research through networks.	CA has continued to work with applied research networks, and avoided too much emphasis on isolated rural communities
ACACIA I: recommendations mentioned in the External Review		
Acacia I recommendation	*Acacia II response*	
It is recommended that Acacia rethink its initial assumptions and set new goals and objectives	This was done in the prospectus and adequately took into account the changes in ICT4D priorities.	CA reflected the commission from the Taskforce, and adequately took account of changes in ICT4D priorities
It is recommended that Acacia consider focussing its program, possibly by reducing the number of program areas from four to two, and by more concentration within its applications and cross-cutting themes	Acacia II did exactly the opposite of this. It expanded its countries of operation but took a new approach of networking a number of partners for each crosscutting theme,	Similarly, the CA programme did not limit itself to a few countries but worked across the region to build regional capacity. Networks often and mainly stretch across several countries.
It is recommended that Acacia should urgently establish integrating mechanisms for sharing information and exchanging ideas that would also cross the language barriers, particularly between its four countries of concentration.	There has been action taken on completing the previous research (Acacia I) – completing PCRs, disseminating results, publishing books and compilations of results. However there continues to be an unevenness in the sharing and exchanging of ideas, particularly across the language barriers – this is discussed below. A revised communication strategy is being discussed and a program of rolling PCRs will help – see below.	IDRC has caught up with their PCRs generally. We note that since many of the projects such as UHIN were funded by several small grants, there was a reflection process before the next step of funding. Communication continues to be a little uneven (see section on Reach). Although improved, it still requires ongoing evolution to make optimum use of the changing international connectivity.
The assessment has made some specific suggestions for focussing the work in natural resources management, health, education, e-commerce and small business, human rights and governance, gender and youth issues.	Acacia II has undertaken projects in each of these areas but it is not clear if they are a specific and conscious response to the recommendation.	CA was able to identify and work with specific connectivity issues that indirectly affect mainstream development.

Acacia I lesson	Acacia II response	Re:- Connectivity Africa
It is recommended that Acacia develop a new strategy towards telecentres based on an assessment of which pilot projects it should, and can, maintain for the next Phase. It should consult with others including the NAACs, project leaders, communities and other donors and communicate its strategy to all interested parties.	Acacia II has diminished its involvement in telecentres while at the same time supporting other actors in their work in this area. The new project with Microsoft seeks to respond further to this recommendation. The final report (2004) of the project "Organisations Populaires et Technologies de l'Information et de la Communication (phase II) : Ancrage Economique confirms how difficult it is to empower poor people in poor areas." -	CA has worked with Telecentres – mainly as a platform for exploring new forms of wireless connectivity, although some discretion was used to assist a centre that was destroyed by fire.
It is also recommended that Acacia change its focus from telecentres to the broader question of public access. Acacia should adapt its telecentre research framework to one including other models for community access.	Acacia II has focused more on the wider question of public access- e.g. Uganda Universal Access Policies, Cybershepherds, Manobi, Cyberpop	The exploration of low cost alternatives has been applied across the board, and any involvement of telecentres has been incidental where relevant.
It is recommended that additional resources be allocated to ELSA activities so that there can be early outputs on evaluation and learning from Acacia projects. A major initiative or evaluation "mission" might be considered for 2000-2001 to obtain some preliminary results and set in place comparative monitoring and evaluation activities conducted by local researchers.	Acacia II has undertaken specific activities to consolidate its learning. However there is an underlying assumption that partners and project implementers should be the primary stakeholders of evaluation and learning (and thereby dissemination of lessons). The External Review team would like to challenge this assumption and suggest that Acacia II would benefit from a more strategic co-ordination of outputs and lessons	CA also seemed to assume that the networks and partnerships would share their own learning, among themselves and with the world. The challenge of the Acacia II team stands – IDRC has a branding and position that the networks cannot match, this value add should be leveraged to share the lessons more widely.
It is recommended that Acacia examine the possibilities for expanding its policy related work and establishing a "think-tank" policy support group or secretariat using the intellectual resources of the project leaders and the National Acacia Advisory Committees.	A "think-tank" was not instigated, although Acacia II has focused on policy work and through its networks facilitated lots of thinking. This is an appropriate response. Examples are RIA!, Rocare, Grace.net Uganda Policy review.	As discussed above, while CA had less of an emphasis on policy formation, it nevertheless assisted networks and partnerships to address policy rather than created a think tank, and this was appropriate.

Perhaps surprisingly the Acacia II External Review does not make specific recommendations for future changes or actions. In an appendix it discusses one or two ideas regarding the evolution of the sector in Africa, and possible responses from Acacia III, and in its conclusions it notes some weaknesses of Acacia II that could be addressed in the future programme. The table below looks at the weaknesses of Acacia II as documented and reflects on whether CA had the same weaknesses. It should be noted that this writer was a part of the Acacia II review team and therefore is able to draw on background knowledge regarding the comment.

Weakness of Acacia II noted in External Review	Re:- Connectivity Africa
there may be a need for an improved information system	Documentation for CA was greatly improved when compared to the Acacia II review.
there seems to be a need for some form of interim report that can be used to both redirect projects (where necessary) and derive lessons learned,	CA funded a number of initiatives in a sequence of small projects – eg PAREN, UHIN, etc. This process enabled the required reflection cycle to occur – the proposal for the next phase was effectively a reflection on what had happened and where the project should go next.
mechanisms that can speed up the publication of research	CA remains weak in dissemination. Publications are available, but the programme would benefit from a more planned dissemination of publications.
mirroring all project outputs on its public website	This has not happened for the CA programme. A CMS website was set up and obviously intended to fulfil this role – however it does not seem to be populated in a systematic way – and descriptions of projects refer back to the IDRC main site which is out of date concerning the CA Programme.
further measures to address the challenge of working in/with French	This remains a challenge
the challenge of gender which should be revisited and revitalised	CA did not seem to revisit nor revitalise.
how it can more effectively learn from other PIs.	CA presents as having only mild interaction with other PIs, other than Acacia.

The Acacia 2005 External Review suggested that Acacia (pre 2005) had concentrated too much on the internet. It stated "Africa has experienced a dramatic uptake of mobile telephony during the lifetime of Acacia II, which caught most observers by surprise. While Acacia II has responded to this, it could have perhaps responded more strongly." We note that CA, despite being implemented by the same team, has taken into account telephony in Africa and that projects such as UHIN made innovative use of the telecom network.

7.2.1 Monitoring and Evaluation

As the findings show, a number of the programmes explored the use of Outcome mapping to document their progress. In the case of FMFI this had a strong impact as the project management grew in their understanding of the social economic context of their work, and moved from a strongly technological view to a greater awareness of the broader developmental impact. Although it was not consistently applied, the ideas and discussions around Outcome mapping had an effect on each of the FMFI partners.

Sharing of evaluation and learning among the team, between networks and within networks is uneven. Within networks it seems to depend on the strength of the network. For instance, technical lesson learning within the wireless networks is quite strong, lesson learning among the AVOIR network seems weak. There was very little articulation in the interviews about cross network learning, and little if any evidence of say the AVOIR network sharing their insights of elearning with the PAREN networks.

The team continues to be strong in sharing information between the different Africa offices. A weekly Skype call seems to enable both management and reflection. The Acacia review noted :- "We note the role of the Annual Learning Forum (ALF) and that it seems to have been valued

by the staff, as has the all staff meeting for the ICT4D program area. There seemed to be relatively little learning across the continents (i.e. by Acacia from other ICT4D program Initiatives). A clear exception to this was the input of Onno Purbo from Indonesia who has inspired many people within Acacia II, and in particular can be thought of as a key stimulation for the FMFI project." The CA team benefited from an ALF in 2007. The team leader commented that "It was actually the best corporate event I have ever attended at IDRC. Lots of interesting facilitation techniques to get at the issues (World Cafe, Rotating Peer Assists, etc). Very, very good."

There seems to be some cross learning between continents. The Acacia Review suggested:- "Many Asian and Latin American countries have valuable lessons for Africa, often having been through in the recent past a particular stage of innovation or program development that is relevant now to Africa (e.g. the Indonesian experience in WiFi and policy)." The wireless projects are connected North North and South South, AVOIR has linkages outside itself, and PAREN is well connected to GEANT but also to Internet2 and related REN activities around the world.

Programme level monitoring and evaluation seemed to be adequate with the IDRC team having a good understanding of the projects they were responsible for. They had a clear grasp of what had been achieved, the challenges of the project, the lessons learned and documentation available including specific evaluation and cost benefit studies.

It can be noted that at the start of the project IDRC and DFID discussed a joint evaluation process for the two programmes. This did not come into effect apparently because of the DFID requirements regarding logical frameworks and Output to Purpose reviews. Nevertheless the exploration of this option is in itself a significant step in donor co-operation.

7.2.2 Risk Mitigation

Risk management was appropriate. At the start of Connectivity Africa, there was discussion regarding setting up an African "Institute". This concept was challenged as potentially leading to an institution that would require basic funding after the programme end, and would struggle to reach sustainability as donors tend to resist funding basic institutional costs. The direction the programme took, which was to incorporate the management of the programme into the Acacia team, was very appropriate. It led to a cost effective approach to managing the programme and sustainability has been enshrined in the networks of African researchers and in building capacity of existing institutions, thus avoiding the risk of creating a new institute with all the challenges associated with such an action.

The risks of sustainability have also been mitigated by the integration with Acacia. By being part of a longer term research programme, apparent one off projects have been able to be drawn into longer term programme, for instance the JuriBurkina programme has now been integrated into the RIJA programme (funded by Acacia).

There was also substantial risk mitigation in its working relationship with UNECA. By clarifying the leadership of the programme, involving UNECA where possible but not seeking to implement a complex management structure with power sharing, the programme has achieved a measure of efficiency that it might otherwise not have achieved.

The programme as a whole has evolved over the period of implementation. Partners were assessed and risk mitigated through the normal approval procedures. The flexibility of the programme and its call to innovation did invite it into a risky space. Technological innovation can often fall down through institutional and contextual capacities, and that has been true for some of the projects. With hindsight a wider assessment of social economic context might have increased the mitigation of some of the risk. Nevertheless the professionalism of the

programme staff and their team approach and use of procedures was more than appropriate, and weaknesses have been used as opportunities for lesson learning.

Finally on risk, there were some risks taken in terms of stretching regulations in order to try new technologies. Africa has a number of examples where the public has implemented an ICT innovation outside of existing regulations, and forced a change in regulation (eg VOIP in a number of countries). In a few CA projects such boundaries were pushed, eg FMFI, however the risks were mitigated by limiting the scale of the action.

7.2.3 Sustainability

Many of the projects have the potential to be sustainable if they embedded within sustainable institutions. Much of the CA funding was for demonstration of innovative approaches. Some of the projects are experimental (eg FMFI) and the take up of the findings is very dependent on the socio-economic context, including the response from the host government and private sector. Some of the projects were more a demonstration of possibilities (eg JuriBurkina). Typically this type of application of ICT very much depends on the political will, in this case to be transparent on judgements in the judicial system.

Other projects were about networks and partnerships and these that laid clear foundations for future activities. The UbuntuNet Alliance is a case in point; it has been registered and there is a business model of subscription that could in the longer term make it sustainable, hence it indeed can be said to be a sustainable outcome of the CA programme.

Overall the CA has shown sustainability where it was intended to show sustainability and it has made a distinct snapshot contribution to a body of knowledge where that was its intention.

8 TOR objective 2 - Document results of the program (i.e. outputs, reach, and outcomes)

The short term outputs from the Logical Framework presented to CIDA were:-

OUTPUTS (SHORT TERM RESULTS)	PERFORMANCE INDICATORS
- Potential ICT users are made aware of low cost alternatives for Connectivity	- Number of demonstrated technology adopted by a third party
African people are trained and capable in the use of new technologies	Number of people trained in the use of new technology
Africans are exposed to innovative uses of ICT	Number of workshops and attendees on innovative technologies
Analyzed and disseminated viability of new technologies in African context	Number of reports produced on new ICTs and their applicability in Africa
- African/international Internet traffic has been analysed and data made available	– Ratio of intra-African to international Internet traffic
Business model for African regional Internet Connectivity has been proposed to potential partners	Number of African countries participating in regional Internet peering
Regulators are sensitised to pros and cons of regional Internet exchange	Number of African regulators participating in work shops on cross-border Internet traffic
- ICT incubators are operational and providing support and mentoring services	– Changes in connectivity among African universities
African universities are benefiting from North/South, South/South partnerships	Number of African universities in network/bandwidth partnership
African universities have increased their ICT skills and knowledge	Number of active participants in African electronic

- Collaborative networks are in place to support African ICT-related communities Donor collaboration in ICTs fostered through organizations like PICTA - Participation of African ICT stakeholders facilitated in global policy fora	networks Number of collaborative networks in place Number of donors supporting ICT initiatives in Africa Number of African participants in global policy fora - South-South exchange visits

As an innovation programme with longer term policy aspirations, no specific numbers were allocated to the performance indicators. It was acknowledged that since the project is about innovation and experimenting with new technologies, that some outputs would be possible and some projects might fail

Accordingly any comment on the outputs needs to focus on the quality rather than the numbers and quantities. Overall Connectivity Africa has delivered a coherent programme of work that by its focus on networks has been able to leave a measure of sustainability in place, and build a lasting capacity in terms of key people.

Number of demonstrated technology adopted by a third party – Some of the technology has been adopted – for instance the refurbishment of Computers for Schools Kenya has demonstrated possibilities to the Government. Uptake will be determined by political will, rather than by technology. The use of wireless technologies has been a strong theme throughout the programme, and sharing between countries has occurred. Measuring uptake in this arena is difficult because of the changes in the overall ICT sector – wireless access to broadband has become common, and commercial hotspots can be found in African capital cities. CA has made a significant contribution to the understanding of how to use wireless technologies in a low cost appropriate way to share bandwidth in rural areas – but large scale uptake is constrained by the economies of rural areas – schools sharing a VSAT may or may not contribute to the costs. UHIN has been restrained by both technology challenges resulting from proprietary hardware, and by political context (the involvement of the Government from the start).

Against this backdrop of challenges and difficult contexts, it is worth noting –
The technologies of UHIN are being shared with Mozambique, CfSK is working with neighbouring Uganda to share its lessons learned and that JuriBurkina is sharing its technology through RIJA.

Number of people trained in the use of new technology & Number of workshops and attendees on innovative technologies – CA has been strong in workshops and trainings. There are clear examples of wireless technology being shared. Although the WSIS event was perhaps questionable in its impact, the presence of CA and wireless demonstrations genuinely enhanced peoples understanding of the potential of wireless. Workshops on bandwidth for academia have led to long term alliances and planning.

Number of reports produced on new ICTs and their applicability in Africa – the documentation on CA has followed trends set by Acacia – key maps and visual packages that succinctly and in an engaging way present key information. CA produced a booklet describing its activities, which was an effective way of sharing its project information with policy makers. However, once again it must be flagged that the booklet has not been updated, and the lessons learned and results of each programme not captured and shared through the IDRC branding. Each project has been undertaking its own dissemination activities, but the strength of the IDRC branding seems to be underestimated.

Ratio of intra-African to international Internet traffic – although this is given as a short term output, it is early days to expect measurable differences for **regional** traffic. The regional IXP project was one that encountered a number of problems. Nevertheless regional traffic will depend on their being fibreoptic communication links between countries – which is still scarce.

The coming few years will see dramatic changes in connectivity between countries, and a regional IXP will potentially play an important role. An interesting spin off from the CA programme may be that personnel who were engaged with CA and had their capacity and vision enhanced by the regional discussions are likely to become the champions of a regional IXP once the fibre is in place (or they will have got tired and moved on to get good jobs with Google).

Number of African countries participating in regional Internet peering – this is to be measured not so much by the actual peering, which is currently constrained by the fibre networks but by the level of discussion – and the level of discussion is high as a direct output from CA.

Number of African regulators participating in workshops on cross-border Internet traffic – regulators have been engaged, both directly through CA, and through co-operation with the Catia programme. This co-operation has enhanced these outputs.

Changes in connectivity among African universities. Again here the outputs can be judged by the quality of the discussion rather than attempting to measure the actual changes (yet). South Africa and Kenya both have viable Enrens, and they and many are planning interconnectivity that will enhance the connectivity between African universities. (eg UbuntuNet Alliance).

Number of African universities in network/bandwidth partnership – the presence of Sudan at the last meeting indicates a momentum of interest that should take the partnerships into the near future.

Number of active participants in African electronic networks – while the UbuntuNet Alliance is the most obvious outputs in this category, it is worth noting the impact of AVOIR. Bringing together software engineers to work on a common open source elearning platform and building the capacity to manage servers and enhance software, is a complementary output for ensuring electronic networks. It should be noted that active participants in the CA programme are also active in non CA networks, for instance C3Net – this contributes to the picture that the effect of the capacity building and support coming from CA contributes to Africa networking as a whole.

Number of collaborative networks in place – the work of Harambee is yet to be proven, but there are a number of networks that are working – OpenMRS while not directly funded by CA is an output of CA and its ART project, AVOIR as discussed above, JuriBurkina and the network of lawyers, and the networks and discussions about wireless technologies are just a few examples.

Number of donors supporting ICT initiatives in Africa – this is an interesting indicator for an output for CA? The number of ICT initiatives in Africa actually seems to have substantially dropped over the lifetime of CA. DFID was running the programme Catia, and while Catia was intended to be a 2 phased programme the second phase was dropped – due to changes within DFID structures and priorities. DFID has now committed funding to IDRC for the coming years instead of running it own ICT initiatives. However, across Africa, there seem to be less funding for ICT now than before. This may be due to the "mainstreaming" of ICT – for instance in health budgets the option of using ICT to increase effectiveness is now relatively standard – e.g. USAID sponsoring Voxiva to get involved with Rwanda health care – does this register as ICT initiative or as a health sector initiative? In most documentation it is the latter. Some donors have moved on from supporting programmes that demonstrate the potential for ICTs; there are a number of reasons for this e.g. Expanding from technology to communications in general; concentrating on specific aspects such as the media; focusing on developing indicators and means of demonstrating the value of ICTs in response to greater accountability.

Number of African participants in global policy fora - South-South exchange visits – while sharing within the continent of Africa has been strong, and the attendance at WSIS was

enhanced by CA sponsorship, there have been few activities that have engaged Latin America and Asia. The wireless workshops have invited Asia and Latin American expertise to join in, and the PAREN partners have been able to attend international meetings.

8.1 Research profile

The first draft of this report prompted an interesting discussion about the research element of the programme. We have seen that the implementation plan seems to focus on outputs, outcomes and impacts. It has the language of implementation. The logical framework submitted to CIDA also has the language of implementation (e.g. "Regulators are sensitised to pros and cons of regional Internet exchange" – i.e. policy influence, and "Africans are exposed to innovative uses of ICT" – i.e. demonstration).

However the logical framework also talks about analysis and dissemination of the analysis (e.g. "Analyzed and disseminated viability of new technologies in African context"). IDRC is a research organisation. And the team managing the Connectivity Africa programme also manage Acacia which is very much a research programme initiative.

So is Connectivity Africa a research programme? In the draft, a sentence saying that it was a research programme was in the text, and two members of the IDRC team came back in their feedback saying "CA is not a research programme". On the other hand the feedback from another of the team members was that the report had not emphasised the research enough. Their comment was that IDRC is a research organisation, and that research underpins everything IDRC does. Their experience is that it is common for partners to mistake IDRC for "another donor", and to request equipment or project funds for implementation. That particular PO fields such requests by filtering them through the criteria of research – will the request lead to analysis and learning that enhances not just the immediate project but contributes to the development community's understanding of this arena.

When we consider the case studies, it is clear that research has been a strong thread running through all projects. Innovation has been carried out in the context of study. FMFI which initially seemed to be a technical innovation project used outcome mapping to get engineers to consider the social impact of their work. Social analysis became a part of the project, and led to a more holistic analysis. It considered the potential replicability and scaleability of the innovations.

Many of the supporting activities for the cases have been in the realm of monitoring or evaluation, or applied research. The research methodologies of Acacia have been used within CA i.e. the value of action research, networks and the approach to network meetings, activities for action implementation and research, and then networking again to share and diffuse the outcomes. This is the use of a research methodology not just to analyse but to enhance the proposition. The result is that there has been valuable lesson learning and a synergy between Acacia (which is clearly a social applied research PI), and consequently CA has been enhanced.

8.2 Reach and outputs – the Websites

When the Acacia programme Initiative was reviewed in 2005, it mildly criticised the website of IDRC. It argued that stakeholders trust the name of IDRC and therefore make it a first port of call when seeking information and research in the ICT arena. The report noted that the website was sometimes out of date, and that the details of the research were sometimes difficult to find on the main IDRC site. In response to this, IDRC noted that many of the research outputs could be found on the web on the project site and that it did not necessarily want to repeat its partners sites on its own – thus devolving the challenge of dissemination.

With Connectivity Africa a new site was set up, which from its look and feel is a content managed system. www.connectivityafrica.ca This site is top hit on Google for the words Connectivity Africa. While the site explains the programme in brief, the projects link takes one back to the IDRC CA pages. The IDRC CA pages are approximately 18 months out of date. While the CA site has three items dated Jan 2007, after these items the next date is July 2005. Events are dated 2005. Documents are dated 2005. This would seem to indicate that the site was not populated between these dates.

Updating websites is a perennial challenge. CA intended to share the innovative threads with the wider world, to stimulate discussion about regional connections, and discuss Africa futures. Outputs can be found on the web – UbuntuNet Alliance in Google brings up their home page, and an updated site is available. However, UbuntuNet alliance as a partner of IDRC is not mentioned on the CA pages, and has one reference on the IDRC main site – an article dated 2005.

The Acacia review recommended a review of the web strategy, and a mirroring of research results on the IDRC site. While reviews have been conducted and some action taken, the experience of Connectivity Africa suggests that further intentional dissemination of research outputs on the web would be worthwhile. We also acknowledge that policy makers in Africa are not yet in the habit of using the web to find new ideas and materials, and that there is still a strong role for paper. The CA booklet seemed a good idea, and it was made to be easily updated. It is a recommendation that an updated version be produced and distributed to key stakeholders.

The team have noted that the networks themselves are a form of reach and "dissemination". It is true that projects such as AVOIR or PAREN have drawn into discussion many stakeholders that might want the details of the project. Dialogue is a factor in effective communication of research and the networks themselves do indeed provide a pathway for such dialogue. The outputs of the project can be distributed throughout the networks, and through a process of dialogue can be assimilated with a greater understanding than a simple paper or digital publication. However, while the reviewers note that the above is true, and that communicating research is very effective within the context of a network, the reviewers believe that a wider "announcement" process which can draw people into the networks and dialogue is still pertinent. Indeed the CA team do seem to subscribe to this view as well, as evidenced by the effort and professionalism with which the CA booklet was produced. Having created such a booklet, lesson learned documents and policy briefings could be derived from it, and the brand of IDRC and its trusted website are tools to use in this process.

The programme is not yet ended. By the nature of any research programme the main thrust of dissemination of results tends to occur towards the end of the programme. For instance the FMFI book of experiences is not yet published but is available in draft. The review notes that there are publications in the pipeline and would encourage the team to "follow through" with a wide range of outputs that can address different stakeholder groupings. Policy makers are not a homogeneous group, and different products are required to enhance different approaches.

8.3 Programme influence

As described in the findings above, and the analysis so far, the case studies demonstrated clearly a positioning of capacity, demonstration and networks, that could have a long term influence on African connectivity. When discussing programme influence, the TOR breaks the question down to dissemination and utilisation of research results, strengthening capacities of researcher and institutions, influencing policies and/or technologies, including expanded policy capacities, broadened policy horizons, affected policy regimes. It also asks about gender which has been discussed elsewhere in the document, and about the changes in relationships, actions or behaviours of project partners and project stakeholders.

It should be noted that recent research (including IDRC research) has led to an improved understanding of practical policy development processes:

- They are greatly influenced by 'Windows of Opportunity'
- They revolve around 'Communities of Change'
- They should not be assumed to be linear
- They need not necessarily be excessively time consuming

'Windows of opportunity' typically occur when there are changes in government or when changes in social-economic environment require policy to be developed or reviewed. Policy reviews may be prompted by a number of factors. New technology in infrastructure is one such factor. For example, the internet is a fast changing technology that creates opportunities to influence policies that affect long term economic growth and the price point of internet access. The innovation component and the regional connectivity themes specifically address these possible windows of opportunity.

Similarly engaging with 'Communities of Change' is about finding the right people, engaging with the right organisations, negotiating common ground and win-win changes. As has been discussed, the emphasis of CA on networks and partnerships addresses this feature of policy influence.

The following table presents comments for each of the requested observations from the TOR against each of the case studies. Thereafter follows a short discussion based on the themes.

Table of influence of Case Studies of Connectivity Africa

	2.2.1 Dissemination	2.2.2 Capacity	2.2.3 Policy influence	2.2.4 Gender and Social Factors	2.2.5 Change in behaviour of Boundary Stakeholders
Health Information Network (UHIN + MHIN)	Well known within Uganda, discussed at top government levels, shared with and replicated to Mozambique	Strong lessons learned, documented and shared widely through international connections.	Encouraged Govt to assess ICT eHealth strategy	Outcome mapping used to document social factors of the project, including gender aspects	Changes in Continuing Medical Education, and reporting
Anti-retroviral Therapy Rollout	Well known throughout South Africa, affects actions at a State level, influences planning throughout country	Strong lessons learned, documented and shared widely through international connections.	Encouraged Govt to assess ICT eHealth strategy	Data allows for disaggregation including gender.	Strengthens ART actions – a key action in HIV AIDs control.
AVOIR	The network potentially shares the outcomes across a number of universities across Africa – limited at the moment by outputs and other contextual constraints.	Network potentially builds capacity of researchers – and there is some evidence, however could be stronger	Influences university policies regarding elearning, and software engineering. Impact yet to be determined – evidence that some universities wanting to adopt elearning have been restrained, and yet in the longer term this might be better than an abortive start.	No evidence of gender sensitivity or social factors.	Changes noted in confidence and strength of technical departments to assert their role in supporting IT services throughout the university.
PAREN (UbuntuNet Alliance)	Excellent dissemination and discussion of the issues, at very appropriate levels – among chancellors, IT support services, and Government.	Strong development of capacity and understanding, leading to formations of partnerships and networks.	Strategic discussions with Government and private sector have influenced policies. Contributed to the inclusion of Open Access in Nepad East Africa cable. Influences price points of ICT connectivity.	Not directly gender sensitive, although female executive for UbuntuNet Alliance.	Changes in understanding and behaviour in co-operation between universities – with associated spin offs of joint actions.

Computers for Schools Kenya (CfSK)	Wide dissemination and awareness within Kenya	Built strong capacity within organisation, in local support centres and in teachers.	Government notes CfSK as example of where it would like to go in Policy. Discussion and influence of policy very high.	No gender bias shown, Schools have high number of girls and computers are made available on an equal basis.	Changes in Schools and ability to deliver ICT based education
FMFI	Weak in dissemination of outcomes but not yet completed as a project. Some sharing of wireless experiences.	Built capacity of researchers both technical and socio-economic skills.	Limited impact on policy – indirect engagement through CSIR director, some influence on Canadian thinking	No direct gender counterbalancing	Piloting of low cost alternatives – yet to be scaled.
MICTI (Mozambique + Uganda Incubators	Good dissemination of experiences – in country and as part of global discussions on incubators	Direct impact on capacity of government, researchers and private sector to develop ICT businesses.	Strong influence on Science and Technology development, contributing to government policy and planning	No direct gender counterbalancing	Changed Government thinking on ICT and small businesses.
JuriBurkina /RIJA	Good dissemination within Burkina Faso. Good dissemination in French West Africa	Built capacity of lawmakers, as well as technical skills.	Influenced policy on judicial system. Positive impact on corruption	No direct gender counterbalancing	Changed behaviour of lawyers and judges in judicial system – more open, more transparent.
ECA (PICTA, CA)	Awareness of ICT issues, but stumbled midway and was relaunched	Mild direct or indirect capacity build	Engaged with donors to influence policy. Limited direct outcomes as PICTA but ECA taking strong role in brokering discussions on ICT.	Sets good example of female leadership, and discusses gender implications.	Mainstreaming ICT into economic discussions.

The influence of CA can be presented as headlines broken down to the four sub themes:-

Innovation in the Use of ICTs
Low cost alternatives have been demonstrated. In particular :-

- the use of wireless technologies over distance in order to share bandwidth across local institutions (Schools, Government Centres, Telecentres and Medical facilities). There is a danger that the technical output of such experiments will be overtaken by new technologies (eg WiMax), however the people networks and capacity built are valuable in the longer term.
- refurbished computers have been shown to be a viable mainstream low cost technology for Schools
- the use of PDAs have been demonstrated as a viable means of collecting field data, and for a two way flow of information including personal professional development

Who has this innovation influenced?
Researchers and institutions:- We have seen that a cadre of Africans have explored and learnt about wireless technologies. Their capacities have increased, and whichever direction the technology goes, their confidence to try innovation has been increased. This confidence to explore is a valuable commodity in ICT. ICT is an ever changing sector, and new opportunities and possibilities are constantly arising. If people have gained a confidence that just says, "I could try and see if it works", then that alone is of incredible value.

Expanded policy capacities. Demonstrating the innovative use of ICT, has influenced policy makers. For instance the MRC in SA has been able to gain a view on information management within the SA health system which has changed from disease orientation to a patient focus.
Broadened policy horizons. FMFI and the wireless connectivity projects have demonstrated how the new technologies might be used in connecting institutions, and thus can be said to have broadened the current policy horizon. The default position for regulation tends to be the adoption of international standards. For example most regulation takes the unregulated frequency of WiFi and limits it reach by limiting its power, however innovations within CA demonstrate that this might not be the best approach for Africa.
Affected policy regimes. It is clear that CfSK and UHIN have influenced policy makers in Uganda, Kenya, Mozambique.

In addition to this, the projects, and hence the programme, may have influenced policy makers beyond their immediate stakeholders. For example, the reviewer attended a workshop in the UK, sponsored by the Development Studies Association, where a Nigerian health worker presented the case of UHIN as an example of a successful project, which could be expanded into his own country. Catia also used many of the innovation outcomes of CA in its trainings of regulators and other policy influencers.

These innovations are exploring the windows of opportunities opened by technical changes, and as such are influencing research and policy.

African Regional ICTs
The cadre of researchers mentioned above has also explored the regional connectivity, and found a voice to argue their case for better connectivity. In particular:-

- Academia has been developing plans that will enhance regional connectivity
- Activities on the GSM network have facilitated peering of GSM networks
- Wireless capacity building workshops brought together players from different countries that will work together towards regional actions as and when appropriate.

The higher educational institutes of a number of countries have addressed their connectvity issues. This has not only enhanced their own understanding of connectvity and its place in research and education, but they have been able to get involved with and take advantage of a significant policy "window of opportunity". Policy has been affected within universities, within national educational policy and within regional ICT infrastructure. As has been discussed, the involvement of UbuntuNet Alliance was key in the fibre optic discussions and whether bandwidth should be based on the Open Access principles.

Research and Development in African ICTs
Connectivity Africa has been able to involve research institutions in a number of key activities that could have longer term impact, while at the same time building the research capabilities. For instance

- MICTI has contributed to Government plans for ICT business
- AVOIR has led to a growth in software development in universities
- AVOIR has contributed to elearning within Academia
- ART has demonstrated efficiencies that could be applied throughout the continent.

Research and institutions have been influenced by the programme. Universities have explored working with the private sector, in the context of the development of the country. AVOIR has been a vehicle to explore elearning, and many institutions will have their overall educational capacity enhanced once a stable version of the elearning is rolled out. MRC has explored not just the terms of the project but has been prompted to think more widely and holistically.

This theme of R&D in African ICTs has also contributed to policy development. For instance, MRC is discussing with Provincial Health authorities about the handling of management information systems, and is moving towards a harmonisation across South Africa. MICTI has been able to broaden the horizon of the Ministry of Science and Technology regarding its Science Park development and longer term plans for strengthening the Mozambique economy. These actions found a window of opportunity ie the government considering Science Park models, and was able to bring together a community of change ie former Board members of the MICTI incubator development who were able to influence the government.

Partnerships and networks
This theme focussed on the needs for partnerships and networks. In terms of policy influence it was looking for communities of change, and has succeeded. In particular:-

- Academic alliances have demonstrated the value of collective bargaining
- Partnerships have shown how Open source software can be developed into viable packages (OpenMRS and EKewl)
- Judicial openness demonstrates the role of technology in creating a partnership base for a mainstream sector in a country and in a region.
- Donor co-operation has led to synergies and gains (e.g. Catia, CA and ECA)

The community of change created by the alliance of Catia, CA and Acacia stakeholders should not be underestimated. While Catia was focused more on planned policy influence, it often drew on the same people as CA (people who had had their capacities enhanced by CA projects) and on the results of the CA programme, Windows of opportunity for research were taken up, for instance the OpenMRS linkages.

Expanded policy capacities – by providing mechanisms for judicial content, the capacity of the Burkina Judicial system was enhanced by having access to information in a timely manner. So too was the various health systems who had access to timely data, as did the educational systems.
Broadened policy horizons – by demonstrating the synergy that donors can achieve when co-operating, the programme has encouraged different sector ministries to explore working together.

Affected policy regimes – Many of the above have affected policy, for instance JuriBurkina is said to have strengthened the stated anti corruption policies within the judicial system, and changed the behaviour of lawyers.

So were the themes appropriate, did they lead to programme influence, and do the headlines of outcomes given above add up to overall programme value? Our judgement is that it does add up to value. In any innovative venture, there is relatively high risk. The market may not be developed, the concepts or ideas may seem "far fetched" to the status quo, the technology may stumble or by their very nature, pioneering personalities may be difficult to work with and may not stick around to see an idea through. Since Connectivity Africa was commissioned to be innovative, in terms of process it potentially faced some or all of the above. Its navigation through this difficult space without landing on the rocks is a credit to the team.

As described above, and illustrated on the thematic matrix, the individual projects covered both technical innovation and sowed seeds into people. The projects have put in place and contributed to deep discussions about technical connectivity across Africa engaging with private sector and government to influence regional connectivity. And it has built capacity, in African R&D and in partnerships. None of the projects can be called a failure. Even the very few that did not reach their initial objectives tended to contribute to the network development, to discussion and to general knowledge. And the majority achieved their project objectives and contributed to the themes.

Overall the programme presents good value for money. In comparison with comparable programmes such as Catia and Acacia, the programme stands with an equivalent value.

9 TOR objective 3 - Reflections on the strengths and weaknesses of the program's thematic approach and strategies in relation to the current state of the field(s) in which the program is active.

Connectivity Africa was a well timed programme. It allowed IDRC to complement the Acacia activities. Acacia being more constrained to the rigours of good social research, Connectivity Africa was able to be a little more innovative and experimental. The flexibility of the programme allowed it to evolve with the changing ICT sector without being constrained to a predefined research programme. Working alongside the activities of the likes of USAID with Nettel, and DFID in Catia, the programme was able to contribute to policy debates, and policy influencing strategies. For instance the role of the academic networks in the EASSY cable discussions was very important and although the World Bank was the Champion of the Open Access approach, the presence of IDRC and the PAREN networks was key to sustaining the momentum.

It built on the lessons learned in Acacia I and II. The external review of Acacia II stated that projects started in the latter half of the programme initiative used a networking model to add significant value to the research. Networking and partnerships were said to be vital to longer term building of capacity and sustainability. The Acacia II External Review stated:-

"Key to the Acacia II prospectus was a change in implementing strategy from one-off action research projects to encouraging networks of researchers that could undertake both action and applied research around a theme or node of interest. In particular the networks tend to have good connections to policy and decision makers, thus enabling windows of opportunity to be used for policy influence." Acacia II External Review 2005

Since the CA programme has been implemented by the same team as Acacia II it is not surprising, but it is encouraging, to find the same lessons applied across the programmes. One can see how the networks of academia have been able to take up a window of opportunity and influence policy. Similarly the wireless technology discussions have been enhanced by widespread sharing across people networks, enabling lesson learning across countries and regions.

Connectivity Africa was funded by public money in a developmental context. It is therefore appropriate to reflect on – what is the contribution of CA programme as a whole to development?

The diagram below illustrates how Connectivity Africa has contributed to social and economic development themes. From the findings and analysis we can see how each project has contributed a technological innovation or adaptation, or strengthened a network. Column 1 presents the case studies. Column 2 summarises their headline contribution to technology or the ICT sector. However, innovation on its own does not necessarily contribute to development, and columns 3 and 4 seek to illustrate how the innovations have a developmental impact. The items are nominally presented as "activities and actions" distinct from "efficiencies of development interventions", however there is potentially considerable overlap. Low cost computing in itself does not necessarily lead to a development impact, however it does contribute to efficiencies in information management which can in turn can lead to efficient delivery of services, improving the use of resources, particularly human resources in the key sectors of education and health, and improved responses to vulnerabilities of the poor. We use the term "efficiencies" here loosely – it is intended to communicate that the process of service delivery has been improved by system efficiencies, building of human capacity, new approaches, or alternative mechanisms.

The diagram suggests that CA has indeed contributed to developmental activities, building human capacity both technical and in its focus on networks, and presented innovations which, if taken up to scale, could increase efficiencies and effectiveness in service delivery in health and education.

	Technology and ICT sector	Activities and Actions related to development	Efficiencies of development interventions
Health Information Network (UHIN + MHIN +Malaria in Mozambique)	Integrated synchronisation of data PDAs at field level		
Anti-retroviral Therapy Rollout	Open Source Management Systems PDAs at field level		
Computers for Schools Kenya (CFSK)	Refurbished computers Integrated support for Schools		
PAREN (UnbuntuNet Alliance)	Regional and National connectivity efficiencies		
AVOIR	Software engineering Open Source Elearning platforms		
FMFI	Wireless connection of institutions for shared bandwidth Localisation of software development		
Community Wireless Network Project	Wireless connection of institutions for shared bandwidth		
Wireless Capacity-Building for Africa (WCFA)	Wireless connection of institutions for shared bandwidth		
MICTI (Mozambique + Uganda Incubators	ICT based business incubation		
JURI and RIJA	Software development Support for Judicial system		
FRAO Evaluation in Senegal	Support for ICT projects		
ECA (PICTA, CA)	Partnership leading to improved regulation and governance		
Harambee - Reinforcing African Voices through collaboration.	Partnership leading to improved regulation and governance		

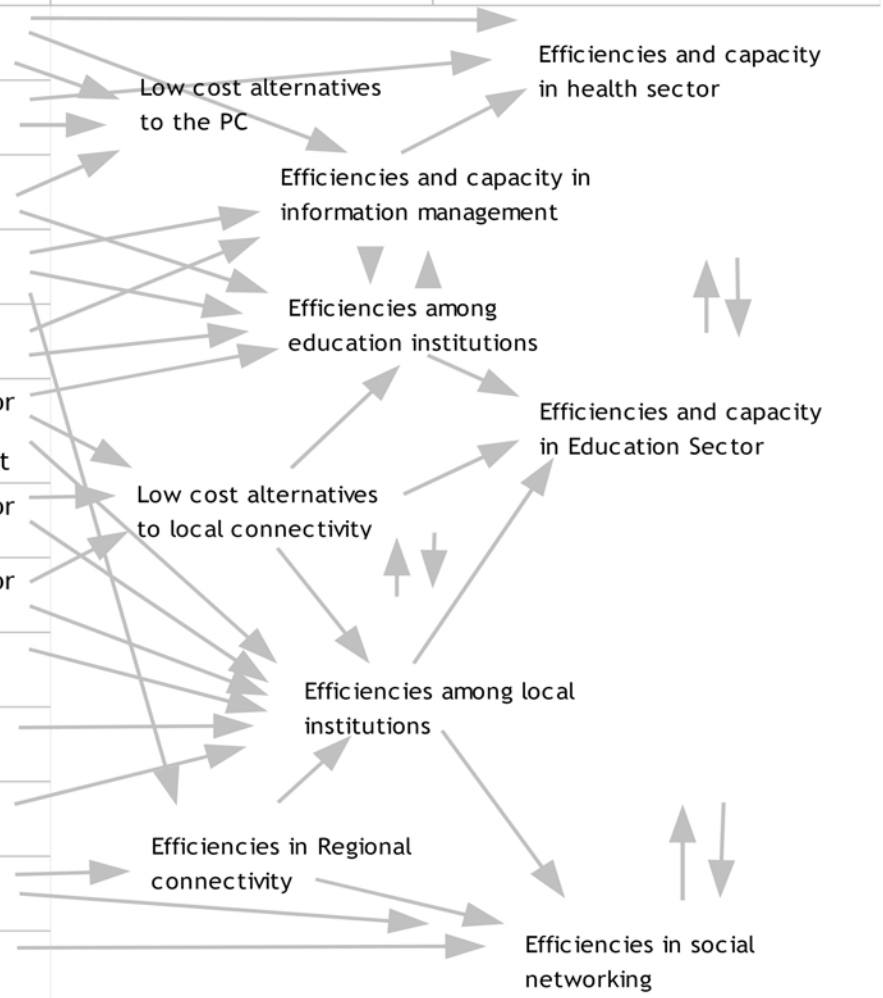


Diagram illustrating the outcomes and influence of Connectivity Africa from the Case Studies.

9.1 Would such an approach be relevant for the coming years?

There have been changes in the sector. IDRC had only a light touch involvement in Telecommunications, and focused mainly on digital connectivity. Telecommunications is now recognised by most players as being the strongest single ICT influence on economies and on the connectivity of the poor. The private sector has forged ahead with innovations, and as the governments have attempted to find the right enabling environment, the capacity of regulators has been built by a number of agencies.

IDRC had an even lighter touch to the older analogue technologies – radio and television. And yet as convergence moves apace, these technologies are now bundled with the digital technologies. PDAs already offer radio, and will in the not too distant future offer television. How will this entertainment enhance or diminish the use of PDA for health monitoring and field level recording of data, how will entertainment offer opportunities for educational advertising, will radio still be a mainstay for market price information?

As 2008 comes, new challenges will arise, and there will be the question of whether the capacity is available in the government for making quality decisions. A number of factors affect this decision making ability. Governments change – ministers are often replaced at election time, so lobbying of a single minister, or building their capacity may not offer a long term strategy. Technology changes – there are new advances which can potentially leapfrog previous constraints. For instance WiFi and WiMax may yet change the landscape of rural connectivity and GSM universal access may become an obsolete concept. Who can advise governments on this, when, although many people can predict the technological advances, very few people in the world have been able to predict the socio-economic impact of such advances (witness the past predictions of mobile phones in Africa and the current reality). And policy changes – the monopoly and duopoly of the early Telecommunication licences are changing currently, who can say what the best policy environment is? (Good policy can be technology independent and can be framed to promote and exploit innovation and emerging technology – it should be predictable but often isn't)

Against these backdrops – personnel changes, technology changes, policy changes – who has the answers? The answer is that no one person has the answers, but they may be found in the collective. Partnerships and networks form the basis of communities of interest, and the communities of interest in their discussion and dialogue feel their way forward together. Governments need access to networks (such as KICTANET in Kenya), that can bring together multi-stakeholder partnerships and networks that can discuss responses to technology changes, people changes and policy changes. (KICTANET was supported by IDRC although not a CA activity – it provides a key example of a multi-stakeholder network that works)

Case study from Catia final report – reinstatement of CCK
When the Minister of Information and Communications dissolved the board of the Kenyan regulator (CCK) in March 2005, it filled the Kenyan industry with alarm. The move was perceived to call into question the independence of the regulator, and to demonstrate the willingness of the government to impose its will with disregard for democratic processes and the rule of law. There followed a broad range of responses, several of which can be traced back to CATIA stakeholders:

- Joseph Mucheru, as chair of the trade association TESPOK, publicised the matter through the media;
- delegates at the NewCom conference in the UK issued a statement to the government of Kenya – this was coordinated by Joseph Mucheru and AfrISPA members;
- KICTANet, as a multi-stakeholder advocacy network, made submissions to the government.

So returning to the question, would a Connectivity Africa programme be relevant for the coming years? The answer lies in its emphasis on networks and partnerships. Regional

discussions such as those manifest in the UbuntuNet Alliance are going to be increasingly important to Africa. The discussions about undersea cabling may be taken up by NEPAD and other donors, but as discussed above there has been a role for IDRC CA programme as a small player to have significant influence. Such a facilitating, animating role would be appropriate for the coming years.

Is there a specific role for exploring low cost alternatives? It is unlikely that a programme such as CA focusing on a sub theme of innovation would find a key role in the coming stages of ICT sector development. Of course someone needs to explore the potential of the technology. However, there has been an assumption that mainstream commercial activity will not explore the lower end of the market. That does not seem to be the case. The telecom sector has responded to the needs of the poor with low cost prepaid packages, lower handset costs, credit swapping, village phone ladies. KDN in Kenya has many plans for low cost wireless access – plans that were misunderstood by ISPs and have been delayed. Cantenna – the key component for wireless boosting that enabled FMFI and others to connect institutions at a distance, is both commercially available, and the global geek community continues to develop it.

Demonstration of new technologies however is an ongoing need in Africa as it is this that builds capacity, and enables the technology to be made a reality for Africa. The CA programme has been a strong complementary activity to the Acacia Programme Initiative and such a parallel programme (which had flexible funding) could work well in the future.

9.2 G8 Africa Action Plan, Dot Force, and OECD.

Finally what might be the mandate for continuing Connectivity Africa? CA was an initiative of the G8 Africa Action Plan and a recommendation from the Digital Opportunity Task Force 2002. In 2008, we can consider the GOOD PRACTICE PAPER ON ICTs FOR ECONOMIC GROWTH AND POVERTY REDUCTION, The DAC Journal 2005, Volume 6, No. 3. This statement approved by all the donors resonates with what Connectivity Africa has been doing and what could be further explored:-

"In practical terms, where ICTs have been highlighted in the PRSP, donors should seek to support some linked infrastructure programmes for rural areas (for example, extending the mobile-phone network into areas where new rural roads are built). Since rural livelihoods and education are said to be win-win investments, resources intended to be stimulation of ProPoor Growth, and which are ICT-orientated, should be concentrated on rural livelihoods and education."

"In considering the contribution of ICTs to achieving the MDGs, (Chapter 3 of the paper) focussed on the three key processes that lead to the MDGs and which ICTs can in some circumstances enhance. The question for policy-makers was said to be no longer whether ICTs can be used or not; they can. Three questions now follow. Should they be used? Which is the best strategy for enhancing livelihoods, for increasing delivery efficiencies and for improving planning processes? And is the most effective strategy one that includes ICTs? ICTs do not have to be treated as a separate path to achieving the MDGs but as a tool to enhance the key processes."

"Having taken this approach, the paper presented some realities that must be faced by donors,
namely:

- Capacity in effectively using ICTs for development and useful content are often the main constraints, not equipment.
- Within the time frame of the MDGs (2015), digital devices with simple interfaces will therefore be the main tool in the field.
- The private sector is instrumental in expanding ICTs for development access, but other players (governments, civil society, etc.) should lead on applications.
- Development of "developmental" content on and through such devices should be a priority for donors. This development should not occur in the "ICT sector" but within the sectoral response – education, health, governance.

- Incorporating ICTs into the planning of development interventions requires an analysis of "with" and "without" scenarios, which requires more rigorous analysis of the possibilities of replicating and scaling current pilots.
- For a more rigorous analysis, more data are required on the linkages between the use of ICTs and the impact on the MDGs."

The quote resonates with the CA programme.

"Capacity in effectively using ICTs"	almost all the case studies.
"digital devices with simple interfaces"	e.g. UHIN, ART, FMFI
"taking the lead on applications"-	e.g. AVOIR (elearning), OpenMRS
""developmental" content"	- information management systems (UHIN, OpenMRS), CfSK, JuriBurkina
"analysis of "with" and "without" scenarios"	Cost Benefit undertaken in e.g. UHIN, ART, FMFI
"more data are required on the linkages"	Acacia and CA working together

10 TOR objective 4 -- Assess the benefits and challenges of the joint governance structures and formal partnerships of connectivity Africa:

From all the interviews, Connectivity Africa has been a well appreciated programme. This is due to a number of factors:-

- The general reputation of IDRC (in its Acacia and CA programmes) is of a well motivated staff who are willing to discuss project plans and "find a way forward".
- The willingness of IDRC staff to co-operate with other donors – DFID in particular has expressed appreciation for the co-operation over the last few years, and was able to describe specifically how IDRC had enhanced its Catia programme. For example, the joint work on the connectivity of East Africa, and the provision of training materials for the Catia regulations stream of work. This appreciation has resulted in DFID funding on ICT IDRC for the coming years.
- The specific interaction with IDRC - partners generally speak highly of the staff and the procedures for funding projects

The link between Acacia and CA, managed by the same team, has added value, and is to be recommended should a future CA programme be funded. The external review of Acacia II noted :-
"The external review felt that the current composition of the team was adequate and reasonable for the work undertaken. The collegial working environment currently experienced within Acacia II has to do with the integration of Connectivity Africa and Acacia. The single and very capable management combined with vision and joint appointments for all Program staff have helped to build this productive environment." This has remained true.

The joint advisory group was appreciated by all in concept, although in practice it seemed to do little to influence the programme. The Team leader appreciated the advisory group and felt it offered "*good strategic advice from time to time, it periodically validated and/or challenged our direction, it forced us to more clearly articulate our program.*"
Two particular challenges were identified in the interviews.

- The timing of a once a month meeting meant that many projects were approved and taken forward before the advisory group could advise and influence them. The group was left with an academic discussion on the project concepts.

- The responsibilities of the group were weak and perceived as weak – hence when members were pushed for time by their regular work, they jettisoned the advisory group meeting which they perceived as having little influence.

Nevertheless like many official meetings and workshops, the relationships enhanced by the official meetings were important to the programme outside of the formal meetings. For instance the working relationship between David Woolnough (DFID) and Steve Song deserves a special mention. They were able to negotiate joint positions on various issues, not least of which was the EASSY cable and as such were able to influence bodies such as the Africa Commission, World Bank, and others.

11 Conclusions

Overall the Connectivity Africa has:-

- Made significant progress towards its objectives
- Explored low cost alternatives for improved connectivity
- Undertaken activities that have led to strong potentially sustainable networks and partnerships
- Positioned networks with capacity that can influence regional connectivity issues
- Offered synergies between projects, and with its sister programme Acacia
- Been a timely programme, appropriate for the changing African ICT sector
- Been managed by a professional team who have been able to make appropriate decisions

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- Undertaken activities that need ongoing support to mature them into scaleable actions

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- Been weak in encouraging all projects to consider the gender impact of their work as a cross cutting theme
- Not offered a coherent single resource for its findings and lesson learning that has utilised the value of the IDRC branding
- Had an advisory group that did not add as much value as hoped, although it stimulated donor cooperation which was invaluable.
- Had a partnership with ECA that might have been enhanced

Connectivity Africa was a timely programme. Its presence and flexible funding added value to the rapidly changing ICT sector of Africa. Its emphasis on network and partnerships was an extremely pertinent strategy for the objective of capacity building, and has left potentially sustainable networks.

If a Connectivity Africa II is envisaged it should retain its emphasis on building capacity, retain the strategy of networks and partnership and continue to push for regional connectivity. While it should keep a view on innovative technology, it should widen the view to include convergence with traditional media, applications and the role of ICT in efficient and effective delivery of development interventions.

It would be wholly appropriate for the same team to manage and implement CA II alongside Acacia. It would be good to continue close co-operation with other donors as and when appropriate and an annual shared workshop with other donors would be appropriate. An advisory group meeting on a 6 monthly basis would **not** be advised. Close cooperation with UNECA needs to be focused around specific activities which UNECA can take the lead on.

And in terms of mandate for further work, CA has applied itself to its original G* mandate, and has further support in recent OECD DAC statements.

Appendices

Connectivity Africa External Review Report 2007

S Batchelor & M Sow

Appendix 1 Terms Of Reference.

Offer of Consulting Contract
2006-2007 External Review of Connectivity Africa
Centre File No 104193-001
(Objectives only)

Review Objectives and Questions

Objectives:

- Travel to west east and South Africa to accomplish the field work
- Assess the extent to which the program is meeting its objectives and aims, as set out in its prospectus [or program document in the case of corporate projects], and identify any evolution in program objectives;
- Document the results of the program (i.e. outputs, reach and outcomes, and main research findings) and analyze their influence;
- Offer reflections on the strengths and weaknesses of the program's thematic approach and strategies in relation to the current state of the field(s) in which the program is active;
- Assess the benefits and challenges of the joint governance structures of Connectivity Africa

The last objective has been added for the review of C A due to its particular funding relationship with Industry Canada and the Canada Fund for Africa at the Canadian International Development Agency CIDA and it's governance connection with CATIA funded by DFID

The following objective which is normally a part of the PI and CP external reviews has been removed in the case of Connectivity Africa because the team is merged with Acacia and there has been no change in it's composition since it was evaluated approximately 1.5 years ago.

Assess the composition and functioning of the programme team as it relates to its ability to meet the programs objectives over the course of implementing this prospectus.

3.2 Review questions:

For objective 1 -- *Assess the extent to which the program is meeting its objectives and aims, assess how risks to the achievement of the program objectives were identified and managed, as set out in its prospectus, and identify any evolution in objectives:*

1.1 Describe and assess the progress of the program towards reaching its objectives;
1.2 Identify any evolution in program objectives and/or in interpretation of program objectives, and any adaptations that the program is making to changing contexts, risks, opportunities and constraints;
1.3 Comment on how the program is undertaking any actions that it proposed in its prospectus to take as a result of comments made in the previous external review.
1.4 Document how the program is undertaking and using evaluation in its work.
1.5 Assess the appropriateness of the risk identification process and the effectiveness of the risk mitigation strategies put in place to support the achievement of program objectives and
1.6 Assess the sustainability of Connectivity Africa interventions (i.e. did CA funded projects that were intended to extend beyond the period of its support succeed in carrying on?)

For objective 2 - *Document results of the program (i.e. outputs, reach, and outcomes):*

2.1 Review the program's outputs to date ("outputs" include, but are not limited to, research reports and publications, websites and electronic lists produced, conferences, workshops and their proceedings, etc.); and comment on their quality ("quality" to be based on consideration of their scientific merit as assessed in relation to the relevant disciplines/fields, their relevance and appropriateness given the intended audience(s) and user(s), and context(s), and the purposes and objectives of the program) as perceived by stakeholders, intended audiences, users, and/or sectoral/regional experts.

2.2 Describe and analyze the influence of the program through its **outcomes** to date ("outcomes" as defined in the prospectus, e.g. the program's contribution to changing the actions, behaviours and relationships of the program's partners); the program's **reach** ("reach" defined as how actors interacted with and were affected by their interaction with the activities and/or results of the program); the **strategies** which contributed to the program's outcomes; and any **constraining or facilitating factors or risks (internal to the program, external to the program but internal to the centre, and external to the centre)**. This should take into account, but need not be limited to, the following:

2.2.1 the effectiveness of the program at promoting the dissemination and utilization of research results;
2.2.2 the contributions of the program to building or strengthening capacities of researchers and institutions; the contributions of the program to influencing policies and/or technologies. In influencing public policy, this could mean:

- Expanded policy capacities -- improving researcher capacities to conduct and create use for policy relevant research.
- Broadened policy horizons -- increasing both the availability of knowledge, as well as the comprehensiveness of this knowledge;
- Affected policy regimes -- the actual use of research in the development of new laws, regulations or structures.);

2.2.4 any contributions of the program to a greater understanding and consideration (amongst program partners and within the field of research) of inclusion of gendered perspectives in research and research processes; any changes in relationships, actions or behaviours of project partners and other project stakeholders (individual, organizations, groups, etc.), including any relationships that the program effected which contributed to development results (e.g., formation of networks, involvement of stakeholders, collaboration among researchers, etc.).
2.2.6 any other outcomes observed.

2.3 describe and analyse the program's main findings/results on the research questions and themes as outlined in the program's prospectus.

2.3.1 identify what conclusions can be drawn from the projects research findings and any contracted research, working papers and/or synthesis work conducted by the program

2.3.2 assess the overall quality of the research findings ("quality" to be based on consideration of their scientific merit as assessed in relation to the relevant disciplines/fields, their relevance and appropriateness given the intended audience(s) and users(s) , and context(s), and the purposes and objectives of the program) and their contribution to international and academic debates, discourse, and/or understanding of the topic(s) under study.
2.3.3 If appropriate, identify any particularly innovative methodologies or research findings and

2.4 The analysis of results should take into account gender and social dimensions wherever appropriate and possible

For objective 3 - *Offer reflections on the strengths and weaknesses of the program's thematic approach and strategies in relation to the current state of the field(s) in which the program is active:*

▪ Comment, based on the evidence, on the extent to which the thematic focus and strategies of the program are consistent with the development goals and objectives it seeks to bring about (strategies including, but not limited to, project modalities (e.g. networks, regional projects, etc.); type and size of projects; types of partnerships (e.g. Canadian, other donor); etc.).

3.2 Identify how and to whom the work supported by the program is relevant.
3.3 Comment on how the work of the program relates to the state-of-the-art in the field(s) in which the program is relevant.

For objective 4 -- ***Assess the benefits and challenges of the joint governance structures and formal partnerships of connectivity Africa:***

4.1 Analyse the opportunities and risks for the center and it partners by linking Acacia and CA, the join tadvisory group of Catia and CA and the linkages of CA with Industry Canada and the Canada fund for Africa

4. Methodology

A common review framework and methodology is used for all of centre's PIs and Corporate Projects, in order to facilitate the use and management of the reviews. The methodological details have been determined through discussion among the program teams, the Evaluation Unit, the reviewers and senior management.

These are program reviews. They will look beyond individual projects, focusing on how the PI or Corporate Project, as a whole, is performing. The review will draw from both program and project level data sources, and seek to triangulate the data from multiple sources. These will include:

1. Program Area documentation: including, DPA presentations and reports, program area meeting notes, PR documents, other key documents recommended by the DPA;
2. Review of program and project documentation: including, at a minimum, (i) the prospectus, Board presentations and minutes, workplans, PI/Corporate Project progress reports, evaluation reports, meeting minutes; (ii) all project abstracts; (iii) PCRs; (iv) the report from the previous external review, if any; and (v) other key documents recommended by the team;
3. Interviews with program team members and senior managers;
4. Interviews with a sample of project leaders/Survey of project leaders;
5. interviews with other program stakeholders and funding partners in Canada abroad (e.g. industry Cnanda, Canada Fund for Africa, CATIA)
6. In-depth case studies of a sample of projects (can include projects and RSPs). This will entail:

(i) review of key project documents (including Project Approval Document, progress and final reports received, publications and other outputs, trip reports, etc.);
(ii) interviews with the relevant program staff;
(iii) interviews with project researchers and other participants, and those said to or expected to have been influenced by the project; the latter will be done through travel to visit field sites of the projects.

For the in-depth case studies, 2-6 projects will be selected. The sampling strategy will be purposeful; the specific strategy will be determined in consultation with TLs/ Corporate Project managers, the Evaluation Unit and the consulting firm, but will be either typical case sampling (to illustrate what is considered normal) from within each of the programs' main areas of work, or maximum

variation sampling (purposefully selecting a wide range of cases in order to examine variations within different contexts and to identify important common patterns across cases). The sampling could be stratified in order to cover the range of facets of each programs' work.

Using data collected from each of the above sources, the reviewers will address the review questions on (1) progress towards meeting program objectives; (2) program results; (3) strengths and weaknesses of the program's thematic approach and strategies in relation to the current state of the field; (4) governance issues

The TL of each PI / Corporate Project (and teams, as appropriate) and the EU will meet to discuss details of the methodology including an appropriate sampling strategy for project leaders and for the case studies. The TL will take responsibility for ensuring that all the necessary documentation is sent to the review and that the logistics of and communication on the review and field visits occur with the necessary stakeholders.

The expected outputs of each external review are:
- a report prepared by the review team of no more than 50 pages that responds to the 4 objectives;
- a brief prepared by the External Review team of no more than 6 pages broken down into the sections below. This brief is intended as an analytical tool for communicating the findings of the external review to the IDRC's Senior Management Committee and Board of Governors, although they will also receive the full text of the external review. Examples of external review briefs can be found at: http://intranet.idrc.ca/en/ev-56892-201-1-DO_TOPIC.html.
- PI/Corporate Project Aims
- Review Methodology
- Review Findings
- Issues for Consideration

Section A9 sets out the Centre's expectations and will form the basis of its determination whether or not the detailed report is satisfactory.

6. Process and Timeline

PPB Management is the initiator and main client of the external reviews; they and TLs/Corporate Project managers are users of the results. The Evaluation Unit will manage the reviews.

1**The Evaluation Unit** will comment on:
- the review's fulfillment of the terms of reference and of reporting requirements;
- the methodological integrity of the review;
- the review's adherence to evaluation standards for utility, feasibility, accuracy and
propriety;
- the clarity and organisation of the report.

Team Leaders / Corporate Project managers, with input from their teams / staff as appropriate, should comment on:

- Any of the above;
- accuracy and/or interpretation of the data and analysis;
- comments and suggestions to reviewers intended to improve the report's usefulness for program decision-making and learning for program improvement.

DPAs and the VP-P should comment on:
I. Any of the above;
II. Comments and suggestions to reviewers intended to improve the report's for the defined primary uses of the external reviews (i.e. fulfilling information needs for accountability for program results; and informing management decisions about future programming directions).

The briefs will be prepared by the the External Review teams and reviewed by the EU, DPA, VP, and appropriate TL/Corporate Manager. The EU will ensure that comments are addressed in both the reports and the briefs and will prepare quality assessments of the reports. TLs/Corporate Project managers will prepare comments on intended use and the DPA will use the reports in preparing his analytical synthesis to the BOG.

Timeline:

Activity	**Dates**	Actual
DPA, TL and Evaluation Unit (EU) identify reviewer(s), interview and reserve availability	Done July	
EU orients reviewer	Done September	
EU, TL, DPA and VP finalise TORs for review (TL gets input from industry Canada and The Canada Fund For Africa)	By November 30	
EU contracts reviewer	By December 15	Dec 21st, signed 9th Jan 07
TL provides all program and project documentation to reviewer	By December 15	Jan 07
Reviewer selects with TL/mamger and EU the projects for project leader interviews and for in-depth review	By December 15	Jan 07
Reviewer submits preliminary external review workplan to EU. EU shares workplan with DPA and TL. TL shares workplan with Industry Cnanda and advisory board members	By January 5	
IDRC and reviewer arrange field visits	By January 5	
IDRC and reviewers arrange field visits	by December 15	
Data collection: i.e. document review, interviews with PI/Corporate Project team members and with project leaders, and visits to field for in-depth studies; Analysis; Report writing	December15 – March 15	March 07
Reviewers submit progress report	by Febuary 15	
Reviewers submit draft reports to EU	By March 30	April 12th
EU submits draft reports to DPA, VP, TL	By March 30	
DPA, VP, TL, & EU provide comments on reports	By April 20	May 1st

to EU. EU forwards comments to reviewers.		
Reviewers submit revised final reports and draft briefs to EU	By May 4	May 12th
EU submits final reports & draft briefs to DPA, VP, and TLs, and prepares tansmital letter for SMC and BOG	By May 11	
TL/Manager sends team response to DPA and VP PPB	By May 25	
DPA prepares management report for presentation to SMC and BOG	(according to SMA schedule)	
DPA and EU practice presentation to Board of Governors	2-3 days before meeting	
DPA and EU present to SMC and Board of Governors	June 2007	
EU reviews process with PPB and makes necessary adjustments	Summer 2007	

7. Documents to be Provided to External Reviewers

The TL will ensure a complete set of program and project documentation is sent to the reviewers electronically and in print (if requested). The TL will ensure that a complete list of stakeholders to be interviewed with full contact details is provided to the reviewers.

Program Area Documentation [DPA]

Program documents:

1. Prospectus and /or planning documents (e.g. logframe)
2. Any PI / Corporate Project evaluations or external reviews, including reports of past reviews
3. PI / Corporate Project Workplans [PPB M / TLs]
4. Any PI / Corporate Project progress reports
5. rPCRs
6. Project portfolio and pipeline (i.e. activities supported during the current CSPF)
7. Project approved documents (PADS) for all projects and research support projects funded since the start of the current CSPF cycle;
8. Minutes of PI Team / Corporate Project staff Meetings
9. PI / Corporate Project outputs
10. Relevant correspondence, communication materials, presentations, conference materials, websites, publications, press reports, trip reports, financial analysis, strategy reflections, multi-media materials, etc and
11. Any other documents, references, website the program deems important.

Project documents [for projects to be reviewed in depth]:

1. PADs and all interim and final technical reports of projects
2. copies of project outputs and relevant websites
3. contact information for project leaders and project partners to be interviewed and;
4. full project file (all information and correspondence)

7. Quality Assessment

The Evaluation Unit will assess the quality of the final external review reports and will report this information to SMC and the Board of Governors. What follows is the criteria against which quality will be assessed.

Rating	***Description***
I. Report's adherence to review terms of reference:	
High	Satisfactorily addresses **all** of the review objectives and questions
Medium	Satisfactorily addresses **most** of the review objectives and questions
Low	Satisfactorily addresses **some** of the review objectives and questions
Unacceptable	Satisfactorily addresses **few or none** of the review objectives and questions
II. Report's reliability (i.e., accuracy - uses evidence to support findings, resonates with information from other sources), and methodological rigour (i.e., feasibility - sound design)	
High	**Usually** draws on and presents evidence to support its findings; and uses rigorous and sound methodological approaches
Medium	**Sometimes** draws on and presents evidence to support its findings; and uses rigorous and sound methodological approaches
Low	**Rarely** presents or draws on evidence to support its findings; and/or has some methodological weaknesses
Unacceptable	**Does not** present or draw on evidence to support its findings; and/or has serious methodological weaknesses
III. Report's utility (i.e., appropriate for review users and intended uses)*: ***based on the definition of use and users at the outset of the study; PPB and team managers' actual use of the review findings will confirm utility**	
High	**Largely** consistent with the review uses
Medium	**Somewhat** consistent with the review uses
Low	**Minimally** consistent with the review uses
Unacceptable	**Inconsistent** with the review uses

Appendix 2 Documents Read for the Review

Projects
2006 – 2007

103404 - Mozambique Information-evaluation

PAD.pdf

103607 - Access to Scientific & Technical Information

Atelier sur l'acc+¿s +á l'information scientifique et technique_Proposition.doc
Dakar IAP Workshop Report_PFU&RPS Draft3.doc
IAP background paper_17June.doc
PAD.pdf
Programs on ICT Resources for Development_26Jan.doc

103646 - Mozambique N.H.I. Network

103646 RSP Feasibility Moz Health Info Network.doc
103646_001.XLS
103646-274(2).pdf
Draft Terms of Reference revised.doc
ICT Projects Planned SEction - ALS Edits - 2-16-06_.doc
LSDI Trilateral PDA Proposal Jan 2006v2.doc
MHIN Preliminary DRAFT Imp Plan.pdf
Mozambique HMIS Meeting Agenda Draft_V2 9.doc
MZ MHIN Proposal - Final (2).doc
PAD.pdf
second draft_he.doc
UHIN Preliminary Evaluation Report Jan-Dec 2005.doc
UHIN report-Interview for HW 23 12 05.doc
UHIN Research Draft Report December 23-2005-Final.doc
WordForge_Proposal_V1.8_01.PDF

103707 - Making EASSY Easy

103707 EASSy and MEDIA and ICTS PAD.pdf
EASSy event programme_10 March 2006_final.doc
EASSy Participants - for report, 23 June.xls
IDRC EASSy narrative report.doc
KICTAnet Final Report to IDRC Media and ICT policy workshop.doc
Proposal IDRC Support for EASSy Campaign 22.doc

103722 - UBUNTUNET Alliance for Research & Education\103722 UbuntuNet Alliance

proposal.doc
Request letter.pdf
Ubuntu2.doc

2005-2006

102512 PAD software incubator

102512 PAD Software Incubator.doc
102512.XLS
incubator proposal - final draft3.doc

102534 Moz Malaria PDAs

LSDI Cover Letter1.doc
PAD 102534 Moz Malaria PDAs .doc
SATELLIFE LSDI Trilateral PDA Proposal hdl_he_.doc
SATELLIFE LSDI Trilateral PDA Proposal hdl_he_1.doc

102982 - HARAMBEE Reinforcing African Voices

Harambee_Proposal_IDRC_final.doc
PAD.pdf

103002 - GKP membership 2005

PAD.pdf

103037 PAREN

ATICS draft v14.doc
higher_education_icts_Africa_steve_song.ppt
Letter to WSIS executive Sec V1.doc
Letter Tunisian Amb V2.doc
letter_to_william_pick_IDRCAfrica v3_1.doc
Letter_to_WSIS_executive_Sec_V2.doc
lettre +á l'ambassade tunisienne V3.doc
lettre +á l'ambassade tunisienne V4.doc
lettre a l'ambassade de Tunisie.doc
PAREN Francais pour site web.doc
PAREN Reportv13.doc
PAREN Reportv15.doc
PAREN WSIS.doc
PAREN_Reportv9.pdf
Promoting African Research and Education Networking V7.1.pdf

102998 Paren Info session at AAU conf

AAU PAREN Presentation.pdf
acknowledgements.pdf
compiled abstracts -english.pdf
compiled briefs.pdf
conf info.pdf
conference program.pdf
cover letter for FAX.doc
PAD PAREN-AAU (2).doc
PAD PAREN-AAU (4).doc
PAD PAREN-AAU (5).doc
PAREN Feedback Actions taken table.doc
paren info session at AAU conf proposal.doc
PAREN information session at AAU conf_RSP V1.wpd
PAREN Reportv12.doc
PAREN Reportv12.pdf

103070 PAREN Donors Survey

103070 PAD PAREN Donor Survey V1.doc
Executive_Summary_Paren_Investment Report.doc
Executive_Summary_Paren_Investment_Report.pdf
PAREN Donor Survey PAD V1.doc
PAREN investment report May25.doc
paren_donor_survey_tors2.doc
paren_donor_survey_tors3.doc
PAREN_investment_report_May25.pdf

103037 PAREN Open Access Conference

PAREN at Open Access Conference v1.doc

103037 PAREN Web Pages

acknowledgements.pdf
conference program.pdf
events.html..html
PAREN at AAU Conf.html..html
PAREN at Open Access.html..html
PAREN at WSIS.html..html
PAREN Reportv15.doc

103058 - Support for CA, Bellanet and PICTA Coordinator at UNECA

PAD.pdf

103103 - Second Connectivity Africa

PAD.pdf

103125_Fantsuam

103125 001 PAD FANTSUAM WIRELESS.pdf
FANTSUAM BUDGET(103125)1.xls
WCN_Nigeria_Kafanchan_20060201_ProjectProposal_Final_v1.0[1]1.doc

103126 Uganda Wireless

103126 BUDGET(1)1.xls
CWRC WORKSHOP ASSESSMENT 181106.doc
CWRCTelecentreAssessment_BackgroundNote_July2006.pdf
PAD 103126 Uganda Wireless1.pdf
Uganda Wireless Project2.doc

103128 Telemedecine Algeria

AlgeriaTelemedecine09-2005.doc
Interim (1) technical report.DOC
PAD-AlgeriaTelemedecine09-2005-V2.doc
proposal-16XI05-AEZ.DOC

103134 – RIJA

103134_RIJA_24-05-2005.doc
103134_RIJA_Budget.xls
103134_RIJA_PAD.pdf
JS_rapport _mission_01-06-06.doc
PAD.pdf
rapport_mission_Ouaga_RIJA_10-02-2006.doc
reaffectation_MG_total.pdf

103137 Promoting the African Research

=iso-8859-1QG=C9ANT_high_speed_communication_network_goes_to_Africa.doc=
EASSy event programme_10 March 2006.pdf
Heloise Emdom_EASSy_invitation.pdf
IDRC Extension Letter 02-02-06.doc
PAD.pdf
Sarua-fibre-final-report-draft-2006-03-04.pdf
WB Toward a Broadband Fiber Network for Mozambique.doc

103138 - New Premises Assistance Manhica Telecentre

103138 PAD Emergency Ass Manhica TC PAD.doc
idrc manhica building request letter.doc
PAD.pdf
request manhica transfer needs.doc
Wide Open Access Proposal.doc

103158 – PAREN

PAD.pdf

103365 - Harambee Focus Network Meeting

PAD.pdf

103386 Satelife CME

103386 CME PAD2.rtf
1033862.XLS
CPD PAD.BMP
JCPD Status Report Draftv5.doc
Planning of CME rollout, Process Plan_ 7-25-052.doc

103464 - Networking Infrastructure and Education

equipment-assistance-proposal-june2005.doc
idrc-budget.txt
img007.jpg
PAD.pdf

103472 - Free & Open Source Software for Local Communities

FinalFinalReport.PDF
PAD.pdf
TTC_Africa_Source2_Proposal_IDRC.PDF

103523 - Wireless Training Workshop at WSIS

PAD.pdf
Proposal.DOC

103675 - Network for Uganda

NREN_proposal.pdf
PAD 103675 NREN UGANDA.pdf

la main +á la p+óte

1036771.XLS

Details of Research Project2.doc
FinalApplic_e-LAMAP111.doc
PAD-LAMAP-BibAlex2.doc
Server and rack offer2.xls

Village Area Network

VAN proposal - UNDP.doc

2004 – 2005

102 875 Open Source Software for NAU

OSS-Workshop-Morroco.doc
PAD.pdf
ProgrammeAtelierFinalV2.doc

102231 - UNECA Collaboration

CA-ECA proposal31.doc
ECA_CA_RSP1.wpd
ECA_CA_RSP1revised.wpd
PAD.pdf

102411 - Database to Support and Evaluate the Public Sector

102411 ARV SIGNATURE PAGE.PDF
PAD Antiretroviral2a.DOC
PAD.pdf

102509 - Open Source Support

avoir_idrc_applic_uwc.DOC
102509 AVOIR PAD.doc
avoir_idrc_applic_uwc_32.doc
budget_avoir_3.xls

102512 - Software Research Incubator in Uganda

102512 PAD Software Incubator 32.DOC
102512 PAD.PDF
102541 Proposal.DOC
Incubator interim report on needs assessment survey.pdf
Incubator interim report to IDRC, Sept 06_ally1.doc

102513 – PAREN

102513 paren PAD.doc
African University Network.doc
AUN Initiative v 03.doc
paren-consultant-tors_0.doc

102530 – Wireless

bmj article1.pdf
Capacity Building for Community Wireless Connectivity in Africa proposal1.doc
Onno Purbo Workshopcreating a change.doc
PADWirelessworkshop1.doc
PADWirelessworkshop112.doc
PADWirelessworkshop13.doc
SA_wireless_048.jpg
SA_wireless_119.jpg
Wireless Real-Time Pill Box - Proposal1.pdf

102531 - GSM Africa

GSM AFRICA PAD2.wpd
GSM for Africa - concept paper v22.doc
GSM for Africa_ADP_TORs v51.doc
GSM_4_Africa_-_Final_Report_V_0.8.doc
GSM_4_AFRICA__NETWORKS_AND_v4.DOC

102539 – AFNOG

AFNOG PAD.doc
Connectivity-Africa-Proposal1.doc

102540 - ECOWAS Workshop

Roaming PAD1.doc

102541 - Open Source Systems

PAD.pdf

102542 - UCAD Resource Centre

102542_notes au budget et calendrier.pdf
102542_PAD.pdf
102542_PAD1.pdf
102542_UCAD Centre de ressourcesPh2_proposition.doc
m+®moire DEA - Dame SAMB.pdf
M+®moire DEA -Idrissa SARR.pdf
Memoire Master Florette.pdf

102543 – JuriBurkina

coord_finan_02-04-2004.pdf
JB_rapport_mission_suivi_10-03-051.pdf
JuriBurkina.02-04-2004.pdf
juriburkina_budget_02-04-2004.pdf
Juriburkina_final_22-03-2006.doc
JuriburkinaPAD.doc
lettre_crdi_02-04-2004.pdf

102545 - FRAO

JuriBurkina.02-04-2004_proposition.pdf
juriburkina_budget_02-04-20041.pdf
PAD102545.pdf
Rap_OM_CS_mission0306-rt-valide.pdf
Rap_OM_CS_mission0506.pdf

102547 - CA Advisory Board

advisory committee PAD1.doc
CA-CATIA AC v2.doc
CATIA-CA AC notes 0904-CA reviewed.doc
Connectivity Africa and CATIA advisory committee.doc
connectivity_africa_advisory_presentation.ppt

102547 - CA Advisory Board\Invitation Letters

Invitation letter-Aki Sawyerr.doc
Invitation letter-Charles Musisi.doc
Invitation letter-Fatima Alloo.doc
Invitation letter-Malick Ndiaye.doc
Invitation letter-Najat Rochdie.doc

102572 - ARIP Phase 2

ARIP2 Pad.doc
ARIP2 Pad1.doc
Connectivity Africa3psl5.doc
Connectivity Africa3psl51.doc

102606 ACP Global Gender and ICT Forum

APCWNSP Gender and ICT Forum Final Report.doc
gender and ICT forum_final.doc
PAD.pdf

102693 Capacity Building for Com Wireless

APC-IDRC-Wireless-Africa_Technical_Report_3_Jul061.PDF
Capacity Building for Community Wireless Connectivity in Africa proposal final.doc
FINAL PAD.pdf
zanzibar_workshop_report.PDF

102735 - Patrick Okello

102735 PAD P. Okello Study Tour.doc
102735.xls
Agenda - August 16 to 20.xls
Brown Bag announcement.doc
canada-report.doc
Flight details.pdf
Invitation letter.doc
PAD 102735 P. Okello Study Tour.doc
Photo_SATELLIFE.jpg
Travel Letter for Patrick Okello.wpd
Travel_Info_ form_e.doc
TRAVELFORM_OKELLO.doc
Visa support letter.doc

102762 - Fantsuam Assessment

102762.xls
Fantsuam Foundation Wireless Network Proposal - Revised Submission2.doc
Fantsuam Foundation Wireless Report - Revised Dec 1 2004.doc
PAD Fantsuam Assessment KJ.doc

102782 M4D

GSM Applications for Development - ACT Forum Call for Papers1.doc
m4dPAD1.doc

102819 CFSK Phase III

102819 CFSK Phase III PAD.pdf
Babikwa Report Draft final
CFSK Business Plan Proposal.doc
CFSK Draft Evaluation Report.doc
CFSK III.XLS
CFSK III1.XLS
final proposal on training and thin client+wireless tech1.doc
final proposal on training and thin client+wireless tech11.doc
IDRC REQUEST-PLUS PHOTOS (1).doc
IDRC-Technical and Financial report(Supplementary Funding).doc
PAD CFSK III.wpd
PAD1.pdf
PAD2.pdf
PAD3.pdf
PAD4.pdf
quote.doc

102875 - Open Source Software For North African Universities

PAD.pdf

102896 training University Bandwidth

bandwidth-infobrief.doc
bandwidth-workshop-costs1.xls
bandwidth-workshops-proposal-IDRC1.doc
Univ bandwidth INASP PAD.doc

102933 Localisation

1029331.xls
IDRC Project Proposal-CommentedV4DON1.doc
localisation-PAD-Final1.doc
PAD1-Localisation1.doc

102998 – PAREN

102998 PAD PAREN-AAU (2).doc
102998 PAD PAREN-AAU (4).doc
102998 PAD PAREN-AAU (5).doc
103070 PAD PAREN at Open Access Conference v1.doc
103070 PAD PAREN Donor Survey V1.doc
PAD.pdf
PAREN at WSIS PAD.doc
PAREN Reportv12.pdf

103068 - VSAT Buyer's Guide

PAD 103068 VSAT Buyer Guide.pdf
PROPOSAL- VSAT Buyers Guide-revised-final11.pdf

103096 – AFNOG

103096 AFNOG.pdf
AFNOG 2005 - Proceeding.doc
AFNOG 2005 EVALUATIONS SUM.doc
Afnog 2005 IDRC Grant receipients.xls
Afnog 2005 IDRC Proposal1.doc
AFNOG 2005 IDRC REPORT1.doc

Advisory Meeting Dakar

advisory meeting.doc
Appraisal Connectivity Africa Advisory meeting V1.doc
Strategic_planning_2005_Dakar_summary1.pdf

Projects
2003 – 2004

draft_workplan.doc
Project X Project Proposal Ver 2.doc

101981 – FMFI

[FMFI] OM SchoolNet Namibia Model.doc

101981_FirstMileFirstInch_budget.xls
101981_PAD_FirstMileFirstInch_04032004.doc
Appendix 2 - Project Progress Reports.pdf
Correspondance FMFI Mesh Netwrok.doc
First Cantenna installed in a rural setting connects.doc
First mile study charter v7CM.doc
FirstMileFirstInch_Proposal_v4CM_27-02-04.doc
mpumalanga network satellite image with links2.jpg
Muroro Dzurini CV.doc
Refurbs to FOSS to WiFi - Concept note draft 10 of 10.doc
rpcrheloisefmfiphase1and2df1__.doc
WOR appraisal Heloise.doc

102136 – UHIN

102136-001_detail_budget1.xls
App 1 List of Participants in Consult Mtgs.xls
App 2 UCHN org chart.doc
App 3 Balazs Kosaras.doc
App 3 Berhane Resume.doc
App 3 Fred Kakaire's CV 2002.doc
App 3 Holly Ladd cv 2002.doc
App 3 Rebecca full cv 2002 .doc
App 3 Roger CV2001.doc
App 4 Job Descriptions.doc
App 6 SOW_Satellife.DOC
App 6 WR_Consulting_agreement.DOC
App 7 Makerere Commitment.doc
App 7 MOH Agreement.doc
App 8 UHIN IDRC budget revised.xls
App 8 UHIN IDRC budget.xls
App 9 IRS Cert.doc
CA_PAD_Healthnet.doc
Conference Report Final.pdf
COVER LETTER.doc
EPIK UHIN.doc
Invitation letter for Patrick Okello.doc
PROPOSAL FOR FUNDING.doc
UHIN Tech Final Report.doc
WITSA public sector excellence award.doc

102137 – ARIP

AfricaIXPRep.pdf
Business_Case_20030916.doc
CA_PAD_ARIP.doc
Conafwkpln-WFS 20030624.doc
draft_workplan.doc
EPIK ARIP info.doc
proposal_ARIP.doc
RXP_meeting_report1.doc
RXP_meeting_report2.doc

102138 – MICTI

102138_001.xls
EPIK MICTI.doc
FASE0_IMPL_PORT_v2_separados.doc
GAD_template_consult.doc
Guns and Roses Moz Trip Feb 2006.doc
kauxique.doc
kauxique1.doc
MICTI Abstract and Objectives-1_01.doc
MICTI Evaluation report v 3z 2005.doc
MICTI report 2005 (3) without pics.doc
Min expression of interest p2.PDF
Min expression of interest.PDF
orcamentos.xls
orcamentos_incmin.xls
PAD MICTI ICT Incubator Phase 3 23062006.doc
PAD.doc.rtf
Request for Funding MICTI 050805.doc
Request for Funding MICTI heloise.doc
Sean Temlett proposal email.doc
Temlett Contract (2).doc
UEM.wpd
Universidade EM - Mozambique Letter1.wpd

102139 – CFSK

CA_PAD_CFSK.doc
CFSK Certificate of Registration-1.doc
CFSK Evluation.doc
EPIK CFSK info.doc
Interim Financial & technical IDRC Reports.doc
Kstc_support_letter.doc
Letter of Recommedation - Starehe Boys' Centre.doc
Ministry letter of recommenation.doc
Phase II Project Proposal - Administration Support.doc
Project Progress Report.doc
Request for Supplement 102139.pdf
Section 12 Computers for Schools English_revised3.doc
Section 12 Computers for Schools Spanish.doc

102160 - ARIP Workshop

EPIK ARIP workshop.doc
Participants CA sponsored.xls
RXP_meeting_report_0.doc

102208 - THINTANA Proposal

APPENDIX C STRATEGY WORKSHOP CONCEPT.doc
CATIA 2a Results.rtf
PAD THINTANA PROPOSAL.doc
Project Abstract&appraisal only.doc
Project X Project Proposal Ver 2.doc
Refcomp Final Report.doc
Refcomp Final Tech Report.doc
Refcomp SNSA SNA Conference.ppt
Supplement 102208 refurb1.wpd

102213 - Picta 2003

Actionplan.doc
EPIK PICTA Meeting.doc
picta budget rev 25 Sept 2003.doc
PICTA_RSP1.wpd
Proposal for PICTA meeting support and facilitation-3.doc

102223 - Bellanet Collaboration

bellanet_RSP.wpd
Harambe Budget Final.xls
Harambee_Proposal_Final.doc
ICT Africa Mapping Oct 2003 final.doc

102223 - On and off-line Support for Open Dialogue in Africa (Bellanet)

PAD.pdf

102328 – Wireless

102328 PROPOSAL GSM for Africa.TIF
GSM AFRICA PAD.wpd
GSM for Africa_ADP_TORs v5_0.doc
GSM_4_Africa_-_Final_Report_V_0.8.doc
GSM_4_AFRICA__NETWORKS_AND_v4.DOC
GSM_AFRICA_PAD_signature_SS 102328.wpd

102496 – VSAT

Nakaseke VSAT PAD5.wpd
Nakaseke_VSAT_VSAT_WIFI_Installation_PAD.pdf
Nakaseke_VSAT_VSAT_WIFI_Installation_PAD1.pdf
PROPOSAL FOR INSTALLATION VSAT2.doc
Revised IDRC VSAT Proposal4.doc
Unesco Nakaseke Power2.xls

Related Doc's

Advisory Team Meetings

AC Briefing21.doc
advisory meeting .doc
advisory meeting DAKAR.doc
Agenda 2003 DRAFT_July3_4.doc
Agenda 2004 Cairo Meetings_V4.doc
Agenda 2006 CA Team Meeting South Africa.doc
Agenda 2006 South Africa Team Meeting.doc
CA-CATIA AC v2 TORs.doc
CA-CATIA AC v3 TORs.doc
CATIA-CA AC notes 0904-CA reviewed.doc
Connectivity Africa and CATIA advisory committee.doc
Connectivity_Africa_Report_Jan_2005_final.pdf
dakar_agenda2.pdf
finalreport_accessandconnectivity 2003.doc
MINUTES 2003 Acacia and CA Team Meeting Geneva.doc
MINUTES 2004 Acacia and CA Team Meeting Minutes Cairo_May.doc
minutes 2006 Nairobi Acacia CA team meeting.doc
minutes Acacia CA team meeting April 2005.doc
Paren discussion Ottawa_10-041.doc
Partnerships and Convergence_Data-10-041.doc
Strategic_planning_2005_Dakar_summary1.pdf

Communication

CA - ICT4D 2003 Newsletter no20.doc
CA - ICT4D 2004 Newsletter no24.doc
Connectivity_Africa_Infobook.pdf
NEPAD PRESENTATION - chasia 2003.ppt

Notes from Regional Offices

From Edith.doc
From Ramata.doc

Progess Reports

2003-2004 CA Grant Arrangement.doc
2003-2004 CA Report (Phase 1).doc
2004-2005 CA Implementaion Plan (Phase 2).doc
CA Annual Report 05-06.doc
CA Annual Report 2005-06.doc
CA_draft_report_Final 2004.doc
Connectivity Africa ProjectsV4.doc
Connectivity_Africa_Report Jan 2005 V1.doc
Report PPR-2005-2006-CA1 FINAL.doc

Workplans

CA_Workplan_2004-2005.xls
CA_Workplan_FY2005-2006.xls
CA_Workplan_FY2006-2007.xls

French Documents

I – Document juriburkina

1-Juriburkina : un premier centre d'information juridique en Afrique de l'Ouest, Document de présentation du projet (25 pages)présenté par Daniel POULIN et Pierre Paul Lemyre

2- Appendix financier du document A1

3- Rapport technique final de juriburkina : Centre d'information juridique (dossier du centre n° 102543-001, 43 page)
Présenté en Novembre 2004

4- Document CRDI, d'approbation du projet juriburkina

5- Document de LEXUM université de Montréal, portant en objet le projet de diffusion libre du droit en Afrique de l'ouest- juriburkina

6- Document de l'université de Montréal, du centre de ressource en droit public (LEXUM) portant informations bancaires

II – Document RIJA

1. Proposition pour la création du réseau d'information juridique Africain présenté par Daniel Poulin , Pierre Paul Lemyre et Bobson Coulibaly

2. Document de présentation de Juriniger portant constat et plan d'action en date du 19 janvier 2007

III- Document FRAO

1- Document d'approbation à l'appui en suivi évaluation au programme connectivity Africa
A l'attention de Mme Ramata Aw THIOUNE
Présenté par CRDI le 22 Juin 2006

2- Atelier d'initiation à la méthodologie Outcome Mapping
Rapport de formation au centre songhaï, Porto Novo Bénin, du 21 au 25 Mars 2006

IV – Document Centre de ressources UCAD

1-Proposition : Centre de ressources en TIC (phase 2°)
Présenté par la faculté des sciences et techniques, département de mathématiques,
Octobre 2004

2- Document d'approbation du CRDI, centre de ressources en TIC phase 2 : Recherche développement d'interfaces hommes-machines sur les technologies sans fil en les logiciels libres
2-1 Appréciation
2-2 Résumé du projet
2-3 Budget sommaire et calendrier des paiements

3 – Mémoire de DEA d'informatique, option : Datamining
Sujet : Equilibrage de charge pour la génération des règles associatives
Présenté et soutenu en publique par Dame SAMB, Août 2006

4- Mémoire de DEA, option : Base de données répartie
Sujet : Traitement de transaction SQL dans un environnement paire à paire : algorithme pour équilibrer la charge des mises à jour
Présenté et soutenu par drissa SARR, Février 2006
5- Mémoire de fin d'études en vue de l'obtention du Master informatique
Option : Systèmes d'information répartis
Sujet : Système d'information géographique appliqué au parcours du bétail : cartographie sur le web
Présenté par Florette Ngangue TCHANGOUE

Documents delivered after first draft
[Hemdon] Trip ART in SA April 2004-October 2006
ALF_2007_newsletter_Eng
ARV2004Report
Comments on the CA Draft Evaluation Report
Connectivity Africa External Review Report v8_he
FMFI reportcm1
Focus_Areas_Project_Selection_Criteria
General Project Selection Criteria
Grant_Arrangement-_Phase2-_IDRC-Draft2
IDRC Background for GG's visit
IDRC citizensvoices blog2
Inhambane Wireless Project
LFA_Connectivity_Africa_26Sept03
Physicians with ICTs Final
QuarterlyARTQ206-1
rpcrheloisefmfiphase1and2df1__he
team_comments_on_draft_CA_evaluation
TOR evaluation 28.11.06
Trip ReportMaxixe

Internet Sources
In addition to the above, the http://www.connectivityafrica.org/ website was consulted, following its links back onto the main IDRC site http://www.idrc.ca/acacia/ev-85796-201-1-DO_TOPIC.html In addition related sites were also consulted, key documents or front pages included:-
http://pda.healthnet.org/
http://www.bridges.org/case_studies/351
http://www.mrc.ac.za/
http://avoir.uwc.ac.za/avoir/index.php?module=cms
http://www.ubuntunet.net/
http://www.cfsk.org/
http://www.uneca.org/
http://www.fmfi.org.za/
http://www.micti.co.mz/
http://www.juriburkina.org/
http://www.lexum.umontreal.ca/
http://www.catia.ws

Key words in Google were investigated. These included combinations of Geographical delineates such as continents (Africa) or countries (eg Uganda), with combinations of specific project related words such as pda, information systems, ICT, Health workers; open source, elearning, Blackboard, academic networks; bandwidth, university; low cost computers, refurbished, schools, ICT; wireless, cantenna, wifi, powerline, wordforge, translate; SME, incubator, ICT; legal advice, court decrees; research, applied, innovation, capacity building, regional networks, idrc, catia, acacia, connectivity.

For each combination, which could be 2 or more words, only the first 3 pages of Google responses were considered.

In addition to the above a number of relevant documents had been previously read as part of the Acacia External Review and the Catia evaluation, which are not documented here.

Appendix 3 Complete list of Connectivity Africa Projects

Project no	Project title	Project costing	Was it a case study project?
102136	Uganda Health Information Network	980,440	yes
102137	African Regional Internet Peering Points	43,000	
102138	MICTI ICT Incubator	187,176	yes
102139	Computers for Schools Kenya (CFSK)	92,300	yes
102160	African Regional Internet Peering Point Workshop	15,000	
102223	Online and Off-Line Support for Open Dialogue in Africa (Bellanet)	80,801	
101981	Comparative study of "first mile" and "first inch" technologies in different low-density contexts	265,317	yes
102208	Refurbished Computers in Schoolnet South Africa: A comparative case study	95,000	
102213	PICTA 2003	10,000	yes
102328	Wireless Voice and Data Technologies for Africa	27,600	
102496	Satellite Communication for Community Development (Uganda)	90,184	
102547	1st CA Advisory Committee Meeting (Mauritus)	25,896	yes
102223	On and off-line Support for Open Dialogue in Africa (Bellanet)	-21,699	
102231	Support for CA and UN Economic Commissionf or Africa Collaboration	180,160	yes
102411	Development and Interpretation of a Medical and Informatics Database to Support and Evaluate the Public Sector Ani-retroviral Therapy Rollout in SA	88,490	yes
102509	Support for Open Source - Open Content & Digital Commons development in Africa	200,000	
102512	Software incubator Research in Uganda	215,000	
102530	Atelier de développement et de formation sur les techologies sans fils (wireless)	26,868	yes
103103	Second Connectivity Africa / CATIA Advisory Committee Meeting	21,709	yes
102539	AFNOG V Workshop	40,500	yes
102541	Open Source Systems in North African Universities	275,250	
102542	Centre de ressources en TIC (Phase 2)	274,300	
102543	JurisBurkina - un premier Centre d'information juridique en Afrique de l'Ouest	84,180	yes
102545	Appui en suivi évaluation au programme CA	138,130	yes
102572	Regional Peering Points - Creating a proof of concept Hub: implementation stage	34,980	
102606	APC WSSP Global Gender & ICT Forum	16,000	
102693	Capacity Building for Coummunity Wireless Connectivity in Africa	319,870	
102735	Study and Information Sharing Tour - P. Okello	9,000	
102762	Assessment of internet connectivity and wireless distribution network of Fantsuam Foundation-Nigeria	18,800	
102782	Mobile Telephony Application for Development Forum Assessment of Internet Connectivity and Wireless Distribution Network of	38,389	
102819	Computeres for School Kenya- Phase III	130,000	yes
102875	Workshop: Open Source Software for North African Universities	53,222	
102896	Support training for the Optimization of University Bandwith	143,100	
103068	VSAT Buyer's Guide	51,400	
102998	Promoting African Research & Education Networking (PAREN)	19,700	yes
103096	Training Workshop and Conference for the African Network Operators Group (AFNOG)	48,300	yes
102513	Facilitation of the development of a PAN African Research and Education Network (PAREN) for access to improved Internet bandwidth		yes

102534	PDA's for Malaria Monitoring in Maputo and Gaza Provinces	70,000	
103523	Wireless training workshop at WSIS	31,500	
103472	Africa Source II : Free and Open Source Software for Local Communities	55,000	
103070	Pan African Research and Education Network (PAREN) Donor Survey	40,202	yes
102982	Harambee: Reinforcing African Voices through collaboration	250,000	yes
103125	Wireless Distribution Network for Fantasum in Nigeria	137,300	
103058	Program Manager : Connectivity Africa and Bellanet International Secretariat	4,583	
103126	Uganda Community Wireless Network Project	165,800	yes
103365	Harambee Focus Network Meeting and Training Workshop	54,677	
103128	Télémédecine dans les régions éloignées en Algérie	250,000	
103675	Workshop for the Establishment of a Research and Education Network for Uganda	13,700	
103134	Réseau d'information Juridique Africain	250,730	yes
103137	Promoting the African Research and Education Networking (PAREN): Preparation and Conference for WSIS 2	179,210	yes
103138	Refurbishing the Manhica Telecentre after the fire	10,000	
103386	Planning the Roll-out of Continuing Medical Education Using Hand Held Technology	110,.000	
103677	La main à la pâte (LAMAP)	85,000	
103158	Promoting African Research and Education Networking (PAREN)	91,740	yes
103464	Networking Infrastructure and Education for African Universities	29,940	
104097	NREN Regional Meeting West Africa	33,500	
103707	Making EASSY Easy: Media and ICT Policy	20,600	
103788	Witsa Award: Patrick Okello	7,830	
103850	Uganda Health Information Network Phase 3	249,000	yes
103920	Testing the African Access Point (AAP)	50,300	
104000	WordForge	100,000	
103646	Planning a National Health Information Network (Mozambique)	30,036	
103729	African Network Operators Group : Training Workshops and Conference (AFNOG 2006)	98,700	yes
103722	UbuntuNet Alliance for Research and Education Networking	190,000	
102195	Building Information Societies for Development (Africa, Asia, Latin America)	105,120	
103404	Evaluation : Mozambique Information and Communication Technology Institute Incubator Project	31,620	
103607	Access to Scientific and Technical Information	23,000	
103939	Third Connectivity Africa Advisory Committee (joint with CATIA)	7,902	
104147	Capaciaty Building for Women Engineers	67700	

Total cost	7,053,053
Cost of all case study projects	3,664,548
percentage of total	52%
Total number of projects	69
Number of case study projects	25
percentage of total	36%

Appendix 4 Extra Case Study Clusters

Wireless Capacity-Building for Africa (WCFA)
Website:- Wireless Capacity for Africa (WCFA) seeks to bridge the continent's "digital divide" by sharing the skills and knowledge required to make appropriate technology choices and establish community wireless networks. Open wireless broadband standards (WiFi, WiMax) not only bring new communication access at very low cost, they offer a decentralized communications model to African communities now wholly reliant on conventional telecommunications.

During the Wireless training in London, the Reviewer was able to see first hand the enthusiasm and buzz that comes from a growing body of Champions for low cost alternative connectivity through wireless hardware. In North Africa, personnel who had received training in order to present at the WSIS meeting, had gone on to train others, and to start a network of people and small businesses that work with these technologies. The combination of lessons learned from various projects, such as FMFI, was being combined with lessons from other continents.

The project positions itself to use the lessons learned from other projects and to share these lessons throughout Africa, even with other continents. It represents the convergence of innovation with people and technology, and the need for networks, again technological and people focused. Coming towards the end of the CA programme it very much sits at the centre of the thematic matrix – embodying the very essence of the CA programme.

Community Wireless Network Project Uganda
From Background document:- "A Community Wireless Resource Centre (CWRC) is being established under the Department nof Electrical Engineering with the general objective to provide or enhance sustainable Internet connectivity infrastructure, particularly in rural or underserved areas in Uganda, by means of wireless technology. As its flagship project, a total of six community wireless networks, consisting of approximately 30 operational radio links, will be designed and implemented in three regions of Uganda. The concept of community wireless networks is based on the possibility for groups or communities to build self-owned and operated communications networks".

This is a newly funded project that has been delayed in implementation due to obtaining equipment. Funded as a research programme, yet also seeking to set up a centre that would build capacity within the country to support Telecentres, it seeks to investigate the realities of wireless connectivity between institutions. As such it is a part of a general thread of wireless connectivity that permeates the Connectivity Africa programme. It potentially builds on the experiences of FMFI and other wireless trainings, and yet the interviewees seemed unaware of the lessons learned in other countries, had purchased proprietary wifi units, and had not yet discussed the social and institutional challenges. From the CfSK interviews, it can be noted that when Schools in Kenya had tried to work together for common use of a VSAT, when one failed to pay their part of the bill, the VSAT was cut off as the others

refused to subsidise the defaulter. It did not seem that the project in Uganda had thought through these institutional challenges.

FRAO Evaluation in Senegal Senegal
This project is designed to provide support to CA partner institutions in West Africa in their M&E activities. The project term is 18 months. It is managed in-house by IDRC. FRAO, initially in charge of its implementation, was going through an institutional crisis. Two CA partner institutions were previously identified to benefit from this support (the Songhai Centre in Benin and the UCAD Resource Centre).
Only the Songhai Centre has benefited to date. The project was expected to be extended to other LIIs constituted within the RIJA context. However, since RIJA has not been started yet, it has a large area to cover.

The first monitoring mission carried out by the FRAO team following the workshop helped ICT platform managers re-assess the methodology and to be initiated in the development of monitoring forms. It appeared that some key concepts in the Outcome Mapping methodology have already been adopted by the managing staff. In the quarterly review meeting, the concepts of change, vision, borderline partners were all used. Also note that activities of canvassing and promotion of their product have intensified. Unclear whether this is an assessment of CA`s work with FRAO or FRAO's work with Songhai. I would recommend that this section be elaborated upon. How did CA handle its working relationship with a partner organization in crisis?

Harambee - Reinforcing African Voices through collaboration. Uganda
Public web document:- "The Harambee project was developed out of those discussions and it is intended to assist the governing partners in the project (APC, Bellanet and UNECA) to both support specific networks and communities and to help the governing partners themselves increase their respective capacities to support their existing partner networks and communities more generally.

African networks and partnerships working for socio-economic development and human rights are actively participating in setting the development agenda and taking ownership of the development process.

The specific objectives of the project are to:
1) Strengthen existing networks and collaborations in Africa as a result of increasing their access to relevant training and support for knowledge- and ICT-related capacity development;
2) Build expertise, based largely in Africa, in the design and implementation of collaborative processes, including conflict resolution and mediation processes, as these are often critical to sustaining partnerships over time6;
3) Raise awareness of African organisations of the potential for collaborative processes to strengthen their collective capacity to effect change;
4) Create a body of research that will act as a valuable resource on a variety of techniques, conceptual frameworks, indicators, etc., relating to facilitation, knowledge sharing, communication and other collaboration-related issues such as gender considerations".

http://www.idrc.ca/uploads/user-S/11592842131HarambeeOverview-v1.pdf

Phase 1 of the project started with a number of networks suggested by the donors. Some of the proposed networks did not want to engage with the project – and did not answer emails or phone calls. Of those that did engage, it was difficult to identify a step change in the way the networks collaborated. Phase 2 however, which has just started, invited applications to join the project, and received over 200 responses – indicating a latent demand. Of those applications 12 have been invited to join the project and work begins in the coming months. Since this second phase has not yet started, it remains to be seen whether this process can create a step change in the networking processes of the Harambee clients.

Appendix 5 Itinerary of Travel and interviews

S Batchelor

13th March 2007	Mozambique	Briefing with IDRC PO H Emdon
14th	Mozambique	MICTI Workshop Malaria PDA Project
15th		Manhica Telecentre MICTI Old and New Centres
16th		AVOIR, Ubunutunet alliance
17th	South Africa	Travel (Ria)
18th		Off (Review interviews)
19th	Cape Town	CSIR
20th		MRC, Duncan Martin (TENET, UbuntuNet Alliance) UWC (re AVOIR)
21st	Kenya	Travel
22nd		UbuntuNet Alliance IDRC PO Office of Minister of Education KICTANET (re overview)
23rd		CfSK Brian Longwe (re overview)
24th		Review interviews, Write up
25th		Off
26th	Uganda	Travel (arrangements and reviews)
27th		Makarere University (re Uganda Community Wireless Network Project) Harambee project

28th	Uganda	Makarere University (re UHIN, PAREN, Uganda ICT Incubator, CfSK evaluation)
29th	Ethiopia	Travel
30th	Ethiopia	UNECA
31st	UK	Travel

In addition, on 8/12/2006 attended Wireless Workshop being held in London UK.
Also met IDRC staff in London and Uruguay between Dec 06 and March 07.

Mr Moctar Sow travelled from Senegal to Burkina Faso during the month of March. Interviews conducted are recorded below.

Interviews conducted:-

Name	Organisation
Prof Karega Mutahi	Permanent Secretary Ministry of Education
Adel El Zaim	IDRC
Aida Opoku-Mensah,	UNECA, PICTA
Alice Nunyua Gitay	KICTANET (Overview)
Alioune CAMARA	Senior Program Specialist – IDRC Dakar
Americo Muchanga,	Ubuntunet Alliance
Brian Longwe	General Overview
Chris Morris	CSIR, FMFI
Chris Seebregts,	ART (Medical Research Council)
Constantino Sotomane,	Micti Incubator
Daniel Babikwa,	RE CfSK evaluation
David Johnson	FMFI (CSIR)
David Woolnough	General Overview (Former Manager DFID Catia)
Deolinda Salomão,	MICTI (UEM)
Derek keats, and James	AVOIR (University of Western Cape)
Dorothy Okello, (and team)	Uganda Community Wireless Network Project
Duncan Martin,	TENET Ubunutunet Aliiance
Dwayne Bailey,	FMFI translate.org, WordForge
Edith Adera	IDRC East Africa
Edouan Kotze	ART (Free State Health Department)
Elizabeth Street	Malaria PDA Project
Enver Ravat	AVOIR (University Western Cape)
F F Tusubira, (and team)	Makarere University DICTS (Overview and Uganda ICT Incubator)
Francisco Mabila (and team, inc users from Education Department)	AVOIR (University of Eduardo Mondlane)
Fred Kakaire,	Uganda Health Information Network
Hamadou Léye ZANRE	Registrar, Court of Cassation
Heloise Emdon	IDRC South Africa
Herman SORGHO	Manager of the lawyers' house, Manager of

	Juriburkina
Hon Saitoti	Minister of Education
Ibrahima NIANG	Resource Centre Project Officer, UCAD Dakar, Professor
Jackie Nham, Vincent Waiswa, (and team)	Harambee
Jamo Macanze, Manager,	Micti Incubator
Jean De Dieu YELKOUNI	Student, University of Ouagadougou
Jim Forster	WCFA
	Kenya Data Networks (General)
KERE	Former President of the Bar, Niger
Lucien IBOUDO	Head of ICT and Archiving Department, Niger SGG
Maria Musoke	UHIN (Board)
Moussa OUATTARA	Senior Registrar, Ouagadougou Administrative Tribunal
Oumarou OUEDRAOGO	Secretary General of the Lawyers' Association, Burkina – Faso.
Pape Ousmane SANGARE	Student, Computer – Mathematics Department, UCAD – Dakar.
Prosper DAGUIZO	Senior Registrar, Tribunal of Accounts
Ramata Aw THIOUNE	M&E Support Project Officer – IDRC Dakar
Régis NDOSSANI	Student, Computer – Mathematics Department, UCAD – Dakar.
Richard Bourassa,	Industry Canada
Samba NDIAYE	Deputy Resource Centre Project Officer, UCAD Dakar, DP Manager
Sandra V. BOUNKOUNGOU	Student, University of Ouagadougou
Sophie Goulet,	Industry Canada
Steve Song	IDRC Canada
Sylvain ZONGO	Chief Executive Officer, ZCP
Tom Musili, (and team)	Computers for Schools Kenya (CfSK)
Uys du Buisson	FMFI (DigiMile)
Victor Kyalo,	UbuntuNet Alliance

Appendix 6 Extract from Catia front page

Catalysing Access to ICT in Africa (CATIA)
The Catalysing Access to ICT in Africa (CATIA) programme aimed to enable poor people in Africa to gain maximum benefit from the opportunities offered by Information and Communication Technology (ICT) and to act as a strong catalyst for reform. It supported a package of strategic activities to improve affordable access to the full range of ICTs, from Internet to community radio. This programme focussed on the need for ICTs to address social and economic development issues. It worked to help build capacity across Africa to achieve sustainable change.
CATIA was a three-year programme of the Department for International Development (DFID) in close collaboration with other donors and role players (e.g. Sida, IDRC, CIDA and USAID). It was implemented in close coordination with the Canadian government's Connectivity Africa initiative. CATIA was managed by Atos Consulting from a programme office in Johannesburg, South Africa. The programme ended in August 2006 although OKN and the Pro-Poor Broadcasting component are continuing until April 2007.
The CATIA programme consisted of nine distinct component projects. These are:
Catalysing informed ICT policy and regulatory reform:
: Facilitating low-cost satellite Internet access across Africa (Component 1a)
: Robust African Internet backbone with exchange points (IXPs) at the core and strong African ISP associations (Component 1b)
: Well-informed, lively and inclusive policy debates across Africa, shaping the local policy environment (Component 1c)
: Positive policy environments for radio broadcasting across Africa (Component 1d)
: An African-led network of institutions actively strengthening African expertise involved in setting ICT related policy (Component 1e)
: Increased capacity for African developing countries to participate in international ICT decision-making (Component 1f)
Strategic Practical Interventions:
: Support for low cost computers and open source software in Africa (Component 2a)
: Stronger network of community radio, FM and public service radio stations across Africa, offering good pro-poor radio programmes (Component 2b)
: A thriving African-based Open Knowledge Network, catalysing the creation and exchange of local content (Component 2c)